

HOUSING DESIGN FOR LAND-LOST FARMERS
IN SUZHOU, CHINA

BY

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THESIS

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ABSTRACT

With the reform and opening-up policy launched since the 1980s, China's economy has been growing rapidly. With this background, urbanization has been on a fast track. However, rapid urbanization resulted in many problems. One of these problems was that more and more farmers were losing their land. The land-lost farmers usually live a difficult life and their new housing usually lacks many cultural features that they have been used to. This thesis proposes a socially and culturally appropriate housing design as a tool to help relieve the above mentioned problems of the land-lost farmers.

In order to alleviate the problems, design patterns are used as principles in this housing design project. The principles are applied based on the specific site context. The principles are generated from *A Pattern Language* to meet the special requirements of the land-lost farmers. They are also based upon vernacular housing and the traditional culture in the Yangtze delta region.

The study site is located in Suzhou, a typical city with many land-lost farmers. Two possible site designs are proposed in this thesis. They are applications of design patterns and can be used at other sites in China.

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I. INTRODUCTION

From the foundation of the People's Republic of China in 1949 to the economic reform and opening-up policy in 1978, China's economic development was divided into four phases:

1953 -- 1957, the first five-year plan

1958 --1960, the Great Leap Forward

1961 -- 1965, National Economy Adjustment

1966 -- 1976, Cultural Revolution

China in 1949 was overwhelmingly an agrarian society, and the first five-year plan aimed to develop the industry. With the help of Soviet Union, there was an economic boom. However, in the following three years the Great Leap Forward happened, which caused a decline in the economic development. It was because the government and its people wished to make the national economy advance as fast as possible. Under the control of a planned economic policy, there was a left-leaning trend and radical plans were made. For the next few years, from 1961-1965, the government made adjustments to take the development beyond the first stage, and there were some gains made from this national economic adjustment activity. However, achievements were short lived because of the Cultural Revolution, which started in 1966 and lasted until the following decade. It was actually a political revolution mistakenly led and started by Mao that later was utilized and harmfully reinforced by two counterrevolutionary groups, which wanted to advance their own interests. There were a series of political campaigns, with respect to culture, education, and obviously the economy, which was

negatively affected. Generally during this ten-year period, there was stagnation of the nation's economy and even some regression.

As part of the "Socialism with Chinese characteristics" economic reforms in the People's Republic of China (PRC), an opening-up policy was started in 1978 led by Deng Xiaoping. Capitalist market principles were introduced in the economic reform. The government reduced tariffs and other trade barriers to attract foreign investment. Special Economic Zones (SEZs) were created to attract foreign capital by exempting them from taxes and regulations. This experiment was successful and SEZs were expanded to cover the whole Chinese coast¹. These actions successfully helped to greatly increase quality, knowledge and standards, especially in heavy industry². China's economic growth since the reform in the 1980s has been very rapid, and economists estimated China's GDP growth from 1978 to 2005 at 9.4% a year³.

¹⁻² Brandt, Loren, and Thomas Rawski G.. *China's Great Transformation*. Cambridge: Cambridge University Press, 2008.

³ "China has socialist market economy in place." *People's Daily Online*, July 13, 2005. Accessed August 9, 2014.
http://english.people.com.cn/200507/13/eng20050713_195876.html.

Economic development in Suzhou

Before 1979, Suzhou was developing a domestic market-oriented rural industrialization. In 1979, the Chinese government singled out a model based on Foreign Direct Investment (FDI): attracting foreign investment seemed to them to be the best way to inject capital, advanced technology and management skills into the Chinese economy, and eventually to generate growth, boost local economies and develop the country⁴.

From 1985, Suzhou chose FDI model as a radically new and different economic model, and this has become a priority for the authorities of Suzhou. This city is located 100 kilometers west of Shanghai in the south-east of Jiangsu Province, eastern China. It is on the lower reaches of the Yangtze River and on the shores of Lake Taihu (the third-largest freshwater lake in China). It is also a part of the Yangtze River Delta region. The convenience of transportation in the city provided an incentive to developers. The economic results of this policy are spectacular: Suzhou has become a Prefecture-City that is at the forefront in attracting FDI and generating growth, experiencing an annual GDP growth rate of about 15% between 2000 and 2005, and 12% between 2005 and 2010 (among the highest rates in China)⁵.

Development zones were developed to attract foreign investment by means of favorable tax agreements⁶. Since 1985, the authorities in Suzhou have opened up large development

⁴⁻⁵ Curien, Rémi. "The growth of development zones and the urban planning strategies in Suzhou." *UrbaChina*, March 13, 2013. <http://urbachina.hypotheses.org/3401>.

⁶ These development zones can be regarded as the daughters of the "special economic zones" that were created in China in the early 1980s.

areas of this sort around the old city (SND, then SIP and others). The creation of these special zones has enabled the city to construct buildings and landscapes, specially designed for the reception of foreign investment⁷.

Urbanization of Suzhou

From 1980 to 1990, the mode “Rural industry – rural industrialization – small-town development – rural urbanization” was the main trend for the relationship between rural industrialization and urbanization in Suzhou, which made the city a typical example of China’s urbanization⁸. However, such a mode depended on the rural area itself and could not fit the economic and information globalization. So the rural industry declined and it required some changes from the old FDI oriented model.

After 1990, Suzhou’s urbanization started developing very fast. The development of production, plus the growth of capital, technology, and financial market accelerated the urbanization. The development of real estate market is the traction mechanism of urbanization, and is also the basic reason of the emergence of development zones which drive urban spatial expansion⁹.

New technologies improved labor productivity and lowered production costs, which

⁷ Curien, Rémi. “The growth of development zones and the urban planning strategies in Suzhou.” *UrbaChina*, March 13, 2013. <http://urbachina.hypotheses.org/3401>.

⁸ Wang, Yong, Guangbin Li and Hengde Cao, “The transition of rural urbanization in Southern Jiangsu Province: A case study of Suzhou.” *Modern Urban Research*, 7, 2006, 9-14.

⁹ Wu, Yali, “Urbanization Mechanism of Suzhou since 1990.” *Modern Urban Research*, 3, 2006, 56-61.

provided more jobs for rural people in the urban environment. Surplus rural labor is the direct motive power for growth in urbanization. Statistics showed that from 1991 to 2004, there were 217,000 rural people moving into the urban area of Suzhou, where the natural increase in population was only 92,000¹⁰. Development zones were built to support the economy's development. To meet the demands of larger number of people, real estate became another industry for accelerating economic development. This also promoted other service sectors, like architectural design, the cement industry, and interior design¹¹. However, urbanization was always related to the land. The transformation of agricultural land was affected greatly by the urban development.

¹⁰⁻¹¹ Wu, Yali, "Urbanization Mechanism of Suzhou since 1990." *Modern Urban Research*, 3, 2006, 56-61.

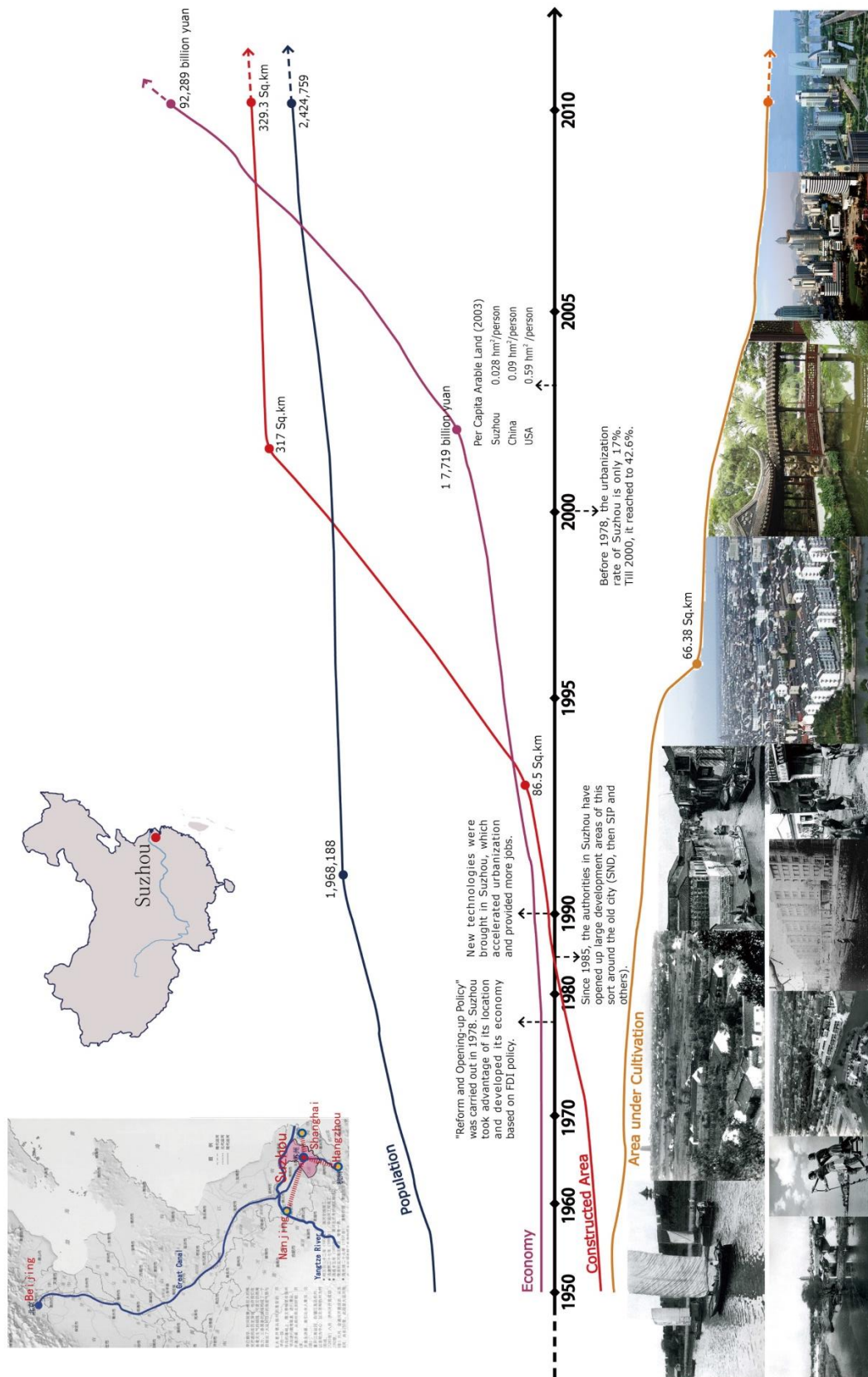


Figure 1. Suzhou timeline

Land transformation

Starting in 1980, because of industrialization, a lot of arable land was used for industrial development. From 1990, because of the new FDI oriented model, rural land was more drastically absorbed in the city's economic development zones. From 1978 to 1990, arable land in Suzhou declined by 16,000 hectares, and from 1990 to 2003 the arable land declined by 79,000 hectares. However, the population growth rate from 1978-2003 of Suzhou was 16.7% while the decrease in arable land was 25.4%, which meant that in the year 2003, the per capita arable land of Suzhou declined to 0.048 hectares/person. With the large amount of migrant labor, it was only 0.028 hectares/person¹². In the same year, the per capita arable land in all of China was 0.09 hectares/ person, while the number for the United States was 0.59 hectares/ person. Suzhou has been facing a serious problem of the arable land shortage for many years (figure 2-1). The rapid land transformation brought many problems. Four major problems are listed in the following paragraphs.

“Villages in the city” phenomenon

“Villages in the city” refer to the remaining dwellings appearing on both the outskirts and the downtown segments of major cities, surrounded by skyscrapers, transportation infrastructure, and other urban construction. It was because of urban sprawl that rural land was taken up on a large scale, but the neighborhoods remain (figure 2-2).

¹² Wu, Yali, “Urbanization Mechanism of Suzhou since 1990.” *Modern Urban Research*, 3, 2006, 56-61.

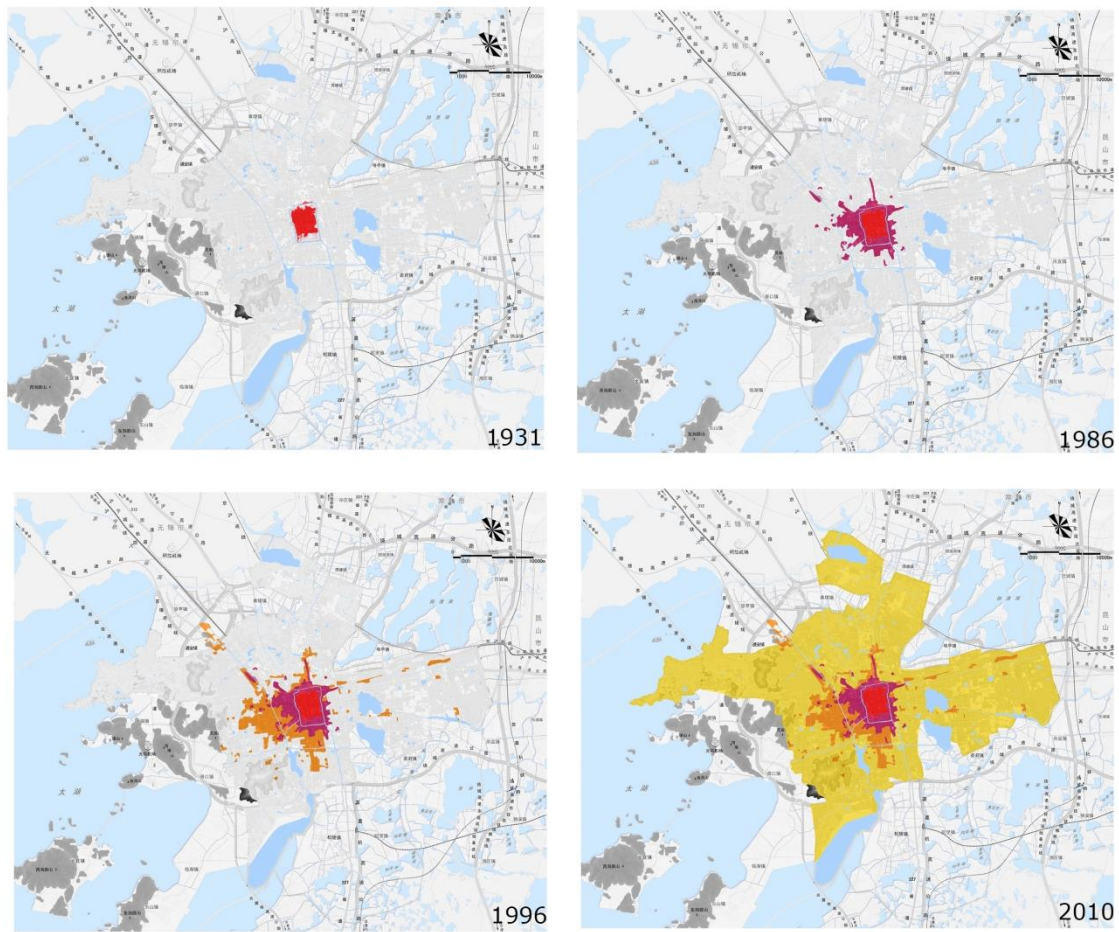


Figure 2-1. Urban expansion of Suzhou

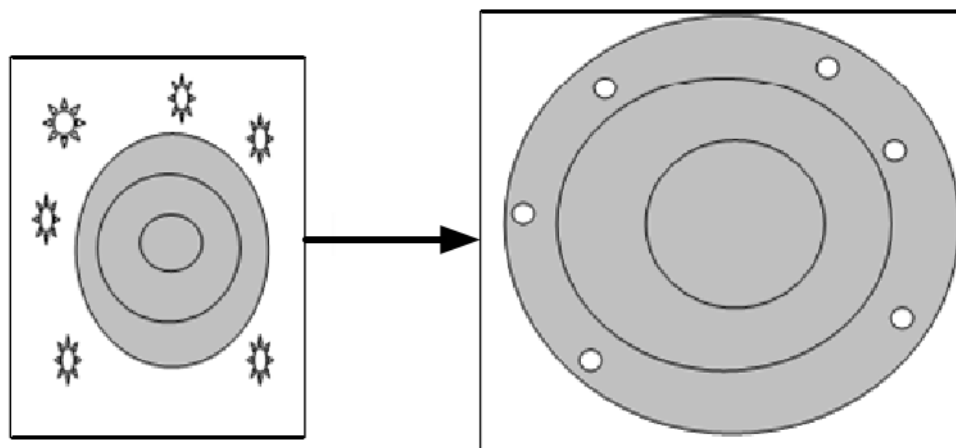


Figure 2-2. Urban spatial expansion¹³

¹³ Li, Junfu, Reconstruction of Villages in the city. Beijing: Educational Science Publishing House, 2006, 56.

So, the villages in the city actually are residential communities left out of the urban management system that fell behind in the urbanization process. They are independent living spaces located inside the city for people who used to be farmers. They are included in the overall planning of the city but take on a very different, rural, character against the surrounding urban environment. The villagers lost their farmland which used to be the only resource for them to live on, that is to say, the mode of production has been totally changed. However, the transformation of the land cannot change the cultural beliefs easily and the villagers still keep their rural regime, maintaining their common properties under the traditional collective system¹⁴.

Villages in the city are often perceived as ugly and blighted features (figure 3-5). The buildings are mainly residential, with illegal additions with little open space, showing a lack of planning controls. There are also shortages of necessary public infrastructure, public green space, and recreation facilities. These lower village land utilization efficiency and hamper overall urbanization¹⁵.



Figure 3. Contrast between village and urban environment



Figure 4. Environment of village inside the city



Figure 5. Current situation of the study area

¹⁴ Tian, Jing, "Study on the Problems of Urban Villages in the Urbanization Process." Master degree thesis of Soochow University, 2011, 18.

¹⁵ Tian, Jing, "Study on the Problems of Urban Villages in the Urbanization Process." Master degree thesis of Soochow University, 2011, 25-27.

Historical sites preservation along Xu River

The Xu River is an important historic waterway and transports drinking water from Lake Taihu to the old town. Since it has a long history, there are many historical sites along the River. However, many of these are not well protected (figure 6-8). As Figure 6 shows, the Hengtang Courier Station is thousands of years old and it is a state protected place. But it is not in a good condition, both the inside walls and the outside walls have been vandalized.

The Hanwang Temple (figure 7) is dedicated to an ancient hero that people honored very much. But the current situation is troubling. It has been turned into a storeroom for a local city department, and the plaza of the temple has become the parking area. The temple has been forgotten by the people.



Figure 6. Hengtang
Courier Station



Figure 7. Hanwang Temple



Figure 8. Zaoshi Bridge

Ecology problems along Xu River

Nowadays Suzhou is facing many ecological problems. Water is seriously polluted. Previously people could wash vegetables or swim in the water. And Suzhou used to have many

canals connecting with each other and waterway transportation was more important than the traffic on the land. However, with the city's development, many canals were filled and others were isolated, becoming dead water bodies (figure 9-11).



Figure 9. Polluted water



Figure 10. Poor water bank

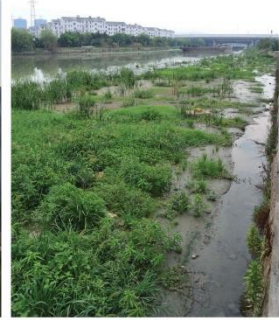


Figure 11. Low water level

Land-lost farmers

Since the accelerated urbanization, the whole country now faces a serious issue—the land-lost farmers. As stated in the “Annual Report on Urban Development of China No 4”, since 2011 the total number of land-lost farmers has reached somewhere between 40 and 50 million and it will increase by three million per year. Experts indicate that by 2030 it will reach around 110 million. Surveys showed that among the current land-lost farmers, 60% of them have basic living difficulties. Only 30% don't have living problems due to land-lost. 81% of them feel worried about their future life—72% worried about living out their life in retirement, 63% worried about economic income, 52.6% worried about medical care¹⁶.

In the following chapter I will explain the details of land-lost farmers issues in Suzhou.

¹⁶ Pan, Jiahua, Annual Report on Urban Development of China No 4. Beijing: Social Sciences Academic Press, 2011.

Totally there are seven chapters in this thesis. The third chapter is Site Context, talking about vernacular housing features and the site situations. The fourth chapter introduces the theory book *A Pattern Language* and the selected patterns which I applied. How I applied these patterns was explained in the next Chapter (Chapter 5). In chapter 6, two possible site designs are shown. Bibliography is referred to the last chapter.

The design principles for this project are generated based upon the selected design patterns, the site situations, and the special requirements from the land-lost farmers. The two site plans are possible ways of using the same set of patterns repetitively. And this project is hoped to be an example of housing design for land-lost farmers that can be used in other sites in China.

Land-lost farmers



•How did the farmers lose their land?

Stage1. 1978 (opening-up and reform)
- 1980s Traditional farmers to part-time farmers.

Stage2. 1990s - Now. From part-time farmers to land-losing farmers

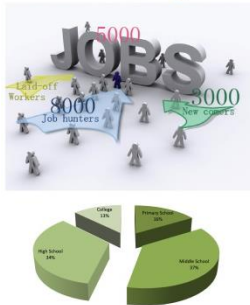
•How were the land-lost farmers arranged?

Land levy compensation 18,000 Yuan/mu
(1 mu=0.165 acre)

Displacement compensation — { 6,000 Yuan ≤16
20,000 Yuan >16

Young crops compensation

hard to find a job



empty nest families



elderly people live in garage



conflicts between the surrounding environment



Figure 12. Land-lost farmers issues

II. LAND-LOST FARMERS

Suzhou is a typical fast-urbanizing city since the opening-up and reform policy of 1980s. In 2010, it was at the top for Gross Domestic Product, Financial Revenue and Total Value of Imports and Exports in Jiangsu Province, and those are respectively took the 5th, 6th, and 4th place in the country (figure 13) .

SUZHOU IN STATISTICS OF 2010		
POSITION OF SUZHOU IN THE COUNTRY		
Gross Domestic Product	5th	Place in the Country
Ordinary Budgetary Revenue	6th	Place in the Country
Total Value of Imports and Exports	4th	Place in the Country
POSITION OF SUZHOU IN JIANGSU PROVINCE		
Gross Domestic Product		First Place in Jiangsu
Financial Revenue		First Place in Jiangsu
Total Value of Imports and Exports		First Place in Jiangsu

Figure13. Position of Suzhou Source: Suzhou Statistical Yearbook

Before 1978, the urbanization rate of Suzhou was only 17%. By 2000, it reached 42.6%. And in 2003 the government took the decision of speeding up the process of urbanization. So with the aid of the government, the urbanization rate unprecedentedly increased—3.7% up per year. And the constructed urban area expanded from 86.5 square kilometers in 2000 to 324 square kilometers in 2009¹⁷.

Farmland in Suzhou is decreasing on an average area of 6,667 hectares per year. In October 2003, the government gave out a notice about ceasing farm work to adjust to

¹⁷ Han, Zhenwu, Weijun Pan, and Ke Liu, "Urbanization, speed up or slow down?—reflection on Suzhou's development of urban and rural integration." Chinese Public Administration Society seminar paper collection, 2011.

industrial demands, requiring that after the fall harvest, 660 hectares of farmland located in 13 villages should cease to be cultivated. Some villagers refused to sign the agreement due to low compensation, but their houses were still torn down. From then on, farmers in Suzhou continuously petitioned the higher authorities (from the county government, to the city government, the province government, until to the central government) complaining about the unreasonable behaviors of the local government. In the mid-July in 2010, in one small town in Suzhou an incident occurred--thousands of land-lost farmers gathered in the middle of the road to block the traffic to protest the unfairness of the compensation. After that incident, the local government suspended the demolition. Some government officials were dismissed and a new approach of improving the compensation for land-lost farmers was adopted¹⁸.

Many grass-roots cadres think that in recent years Suzhou has been developing too fast. The villagers and government were not fully prepared on the management level or on a psychological level. After the farmland was taken away, the farmers were moved to high-rise residential buildings and there was no longer access to nature, and neighborhood relationships were disrupted. Whether from the food production or the farmers' habit perspective, villages should be taken into consideration in the process of urbanization.

¹⁸ Han, Zhenwu, Weijun Pan, and Ke Liu, "Urbanization, speed up or slow down?—reflection on Suzhou's development of urban and rural integration." Chinese Public Administration Society seminar paper collection, 2011.

Loss of land

In the traditional society, cities are opposite of villages, and agriculture is in contrast to skilled labor like handicraft, industry or business. Living in rural areas, the farmers are born to do farm work on the farm land and lack any other skills. It was not until the 1978 meeting that Deng Xiaoping began to endorse the household contract system responsibility, and from then on, farmers were encouraged to put their enthusiasm into agricultural production. Continuous growth of agricultural profits ensured farmers' basic life of food and clothing, and meanwhile surplus products contributed to accumulating capital, which helped to start rural industry. Some of the farmers became workers in rural factories while they still worked on the farmland--they played a role of both farmers and workers, and they were called part-time farmers¹⁹.

From the 1978 opening-up and reform policy to the 1980s is the first stage for full-time farmers transformed to part-time farmers. In the second stage, from 1990s to now, part-time farmers are becoming land-lost farmers. In 1990, the State Council carried out the "Interim Regulations of the People's Republic of China Concerning the Assignment and Transfer of the Right to the Use of State-owned Land in the Urban Areas", stating that citizens could take the land as a compensated use. That is to say, urban land taxes began to be imposed and the citizens could assign transfer, lease or mortgage their land.

¹⁹ Xu, Chenghua, "Shift of Suzhou Land-lost Farmers' Roles in the Process of Urbanization." Master degree thesis of Soochow University, 2004, 16-18.

As a result, a land market has been created and the price of the land has risen inside the city. Many industrial enterprises couldn't afford the high prices and turned to the suburban area for extra space for development. Therefore, the neighboring suburban areas where land prices were much lower than in-town became the most popular places for the expansion of factories. In the first stage, the farmland was only transferred on a small scale and the farmers didn't totally lose their land. However, in response to the state strategy of making Shanghai an engine to drive the economic development of the Yangtze River delta, Suzhou took advantage of the geographical position and made great changes to its industrial building. With the goal of developing tourism and an export-oriented economy, Suzhou set up five national development zones and eleven provincial development zones, and implemented spatial restructuring²⁰.

An eighty square kilometers industrial park in the east and fifty-two square kilometers of a new and hi-tech industrial development zone were added to the central city. They formed a "one body with two wings" layout -- the ancient city in the middle, with the industrial park on its east, and the industrial zone on its west. Statistics showed that until 2000, the new built up area was 23.8 square kilometers, which was 1.7 times the old city's area. In 2001, 4206 hectares of farmland was taken and the number of land-lost farmers was 39,100, representing 1.05% of the farmers in Suzhou²¹. From 1999-2003, 128,667 hectares farmland was taken away

²⁰⁻²¹ Xu, Chenghua, "Shift of Suzhou Land-lost Farmers' Roles in the Process of Urbanization." Master degree thesis of Soochow University, 2004, 18.

and the number of land-lost farmers rose to over 240, 000²².

Rehabitation of Land-lost farmers

According to the “temporary rules of land expropriation in Suzhou”, people who need to be rehabilitated can be divided into three categories – teenagers who are younger than 16; surplus labor force: male (age 16-45), female (age 16-35); and the infirmed and disabled, consisting of the males older than 46, females older than 36, and the disabled. Teenagers would get 6500 Yuan compensation as a one-time payment; the surplus labor force would get a one-time payment of 13,000 Yuan and medical insurance until they became 60 years old; and the infirmed and disabled would get at least 180 Yuan per month and medical insurance²³. But this standard of living for the land-lost farmers declined. Before the farmers lost their land, they could get food from their own land. But now they have to pay for vegetables, grains and other agricultural produce. The limited compensation they secured was insufficient to maintain their life quality.

Displacement

It is difficult for land-lost farmers to find jobs in the urban area. Statistics show that there are approximately 5,000 positions offered every year but there are almost 8,000 job hunters. Additionally, every year there are some laid-off workers, as well as new comers from

²² Chen, Jun, “An Institutional Analysis of the Security of Land-expropriated Peasants—a Case of Suzhou city in Jiangsu Province.” Master degree thesis of Soochow University, 2007, 3.

²³ Suzhou Government. “Temporary Rules of Land Expropriation in Suzhou.” 2000

other cities, whose number is about 3,000. So the competition for finding a job is very intense. For the less-educated land-lost farmers the situation is even harsher, because usually they are only able to do farm work and lack other labor skills²⁴.

Statistics from Maple Bridge Town, located in the new hi-tech industrial development zone, show that in 2003 there were 32,574 land-lost farmers who were unemployed. Five thousand, three hundred and eighteen people (16.33%) had only a primary school education. There were 12,048 (36.99%) land-lost farmers who attained middle school education level. Eleven thousand, one hundred and sixteen people (34.14%) were high school level educated. The number of land-lost farmers who were college educated or above was only 4,092 (12.56%). The people who were not well-educated also tended to be elderly, meaning that they were lucky to get even an unstable or low-paying job²⁵.

Land-lost farmers usually have low incomes. The first reason is that it's difficult for land-lost farmers to get a well-paying job. The second reason is that they do not receive enough compensation from the local government. According to the national law, the compensation for land-lost farmers is composed of three parts: the land levy compensation, the displacement compensation and the young crops compensation²⁶. The local government document "Notice about adjusting the compensation standard for land levy" sets the land levy

²⁴ Xu, Chenghua, "Shift of Suzhou Land-lost Farmers' Roles in the Process of Urbanization." Master degree thesis of Soochow University, 2004, 23.

²⁵ Xu, Chenghua, "Shift of Suzhou Land-lost Farmers' Roles in the Process of Urbanization." Master degree thesis of Soochow University, 2004, 24.

²⁶ "Land Administration Law of the PRC"

compensation to at least 270,000 Yuan/hectare and the displacement compensation to 6,000 Yuan for people under 16 and 20,000 Yuan for people above 16²⁷.

However, such temporary compensation is not enough in the long run. 6000 Yuan is far from what is needed for teenagers' education and living expenses in the future. Previously the farmers could grow food, but now they will have to buy the produce and even the drinking water will be charged (previously they drink water from their own wells in their courtyards). So as a result, the land-lost farmers' living costs are increasing.

Social problems

First, there emerges a transition of living style from the past, which is difficult for the land-lost farmers to get used to. In the traditional culture, parents foster their children until they are economically independent after becoming adults. Likewise, the grown-up children will support their parents to requite the love and care given in their childhood. It's also regulated as an obligation by the Marriage Law. In the traditional rural family, it is common to see that a young couple live with their elderly parents in the same house, even after they have their own children. And from a very young age, their children will learn how to show love and devotion to parents by personal example. Such a feedback mode was prevalent for thousands of years. "Four generations under one roof" phenomenon is often considered as a happy and harmonious reflection of the family relationships. In rural areas, families usually live in several

²⁷ The State Council, "Notice about adjusting the compensation standard for land levy." 1998.

houses that enclose a courtyard in the center, so they can be close to each other yet still keep their privacy. Even if there is not enough space for all of them to live, the young generation will move out to a place that is not far from the elderly parents' house.

However, after they lose their farmland, the young generations will have to go to urban areas to look for jobs, and more likely they will settle down there. In that way, the elderly are left alone in the village, without good care. This phenomenon is called "Empty nest". Only when there is a big festival, will the young generations come back with their children to be together with their parents. Elderly people in rural areas usually have little education and a lack of recreation for pleasure. So they focus around a warm and loving family life as the idea of supreme happiness. But the function of the family life to provide love and care for the elderly has obviously been weakened. "Empty nest" –aged people usually feel lonely, worried and anxious, especially those who are immobilized or those who are in poor health. The transition in family structure has caused a major social problem²⁸.

What's more, land-lost-farmers cannot adjust to the new urban environment either. Before they lost their land, people living in the same village knew each other well. Villagers could go from door to door to chat with their neighbors and the news of the village could be shared quickly. Because people usually didn't lock their yard gates, neighbors could directly go into the yard and visit. Traditional rural society was built on such personal contact networks.

²⁸ Shi, Huizhong, "Current Situation, Problems and Strategies of Providing the Elderly of Suzhou in the Process of Urbanization." *Journal of University of Science and Technology of Suzhou*, 22, 2005, 35.

Everybody knew how many people lived in the village and their names. They were familiar with everyone around.

However, after their land was taken away, the villagers were displaced to urban areas, living with strangers all around. Sudden changes are in every aspect: language, customs, habits, relationships, modes of production, living styles and so forth. Since people are living in tall residential buildings, they cannot easily get to their neighbors. Following their old traditions, farmers keep their habit of chatting with their old friends. And they will come out and stand at the buildings where their friends live and shout at their windows to let them come downstairs to have a talk. Urban residents will feel disturbed by the loud voices. What's more, the farmers keep the tradition of growing vegetables. Even though they don't have their own land, they turn the green belts around the residential buildings into their own gardens. They also use the common space for drying clothes. Since there is no courtyard for such activity, they tie a string between two trees to hang their wet clothes in the public space. Some still use open fires for cooking. So they cook in the public space and produce smoke which irritates their neighbors. Urban residents often think of the farmers as idle people and look down on them. Since urban residents and land-lost-farmers live in the same residential development, there is often social conflicts. Land-lost farmers also have conflicts with the neighborhood committee. The farmers used to have a village committee that was in charge of all the things, from trifles to big decisions in the village. But the urban neighborhood committee is not like that -- it doesn't cover small things like keeping the sewer lines clean. The farmers usually have high

expectations which cannot be met. A survey shows that the dissatisfaction level among the land-lost farmers is as high as 39.7%²⁹.

Another phenomenon is that old people live in garages. Usually the garage is only two meters high, 6-15 square meters and the air and lightning are poor. Sometimes there is only one piece of furniture—the bed and some other necessary articles for daily life in their “home”. In a residential development built in 1997, there are 44 displaced families and four of them live in such condition. In another residential development built in 2003 there are 56 displaced families and elderly people from 52 families have chosen to live in garages³⁰. One reason is that the elderly are disabled and they cannot climb stairs. So the first-floor or a semi-underground garage is more convenient for them. The other reason is their children don’t fulfill their duty to support their parents. Usually the living area for one person is 30 square meters, but the young generation strapped for funds will rent their apartment space to earn more money and let their parents live in the nearby garage.

²⁹ Zhang, Lu, “Research on Community Management in Farmer Concentrated Living Area in the Process of Urbanization — A Case Study of Some Communities in South of Jiangsu.” *Journal of Siehuan University of Science & Engineering*, 25(1), 2010, 38.

³⁰ Shi, Huizhong, “Current Situation, Problems and Strategies of Providing the Elderly of Suzhou in the Process of Urbanization.” *Journal of University of Science and Technology of Suzhou*, 22, 2005, 36.

III. SITE CONTEXT

Xu River is the real mother river of Suzhou. It was deepened and channelized by a Minister called Zixu in the Wu Dynasty (12c BC) and played a role as a transport route and drinking water resource. This river portrays Suzhou, reflecting the city's social, economic, and cultural status (figure 14). Xu River starts from Lake Taihu, passing by Xukou Town and Mudu Town, connecting to the Grand Canal, and going through Xumen Gate, finally connects the Moat (figure 15-16). It is an important waterway connecting Lake Taihu and Suzhou City. The local government proposed Xu River Planning and decided to revitalize the section between the Grand Canal and the old town (figure 17-22). Since the old town is well preserved and very different from the new-built industrial area beyond it, this area is both traditional and modern. In the government document, there is a concept of gradual change from historic to modern. And the divisions of this section from east to west are the “culture preservation area”, the “transitional area”, and the “modern city image area”.

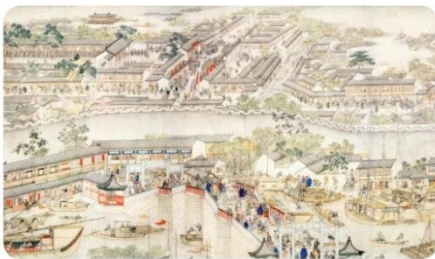


Figure 14. Suzhou's Golden Age



Figure 15. Location of Xu River



Figure 16. Government planning area



Figure 17. Divisions of the site

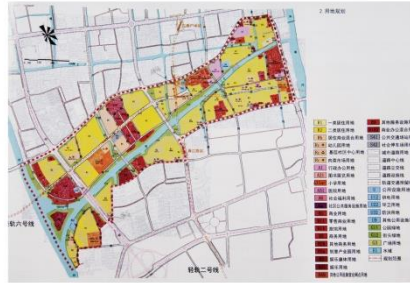


Figure 18. Land use map

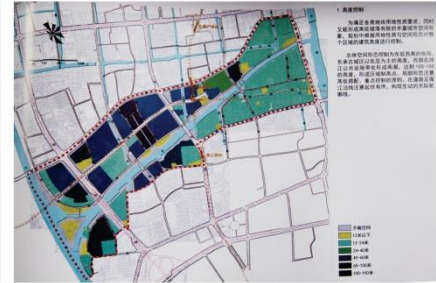


Figure 19. Height control map

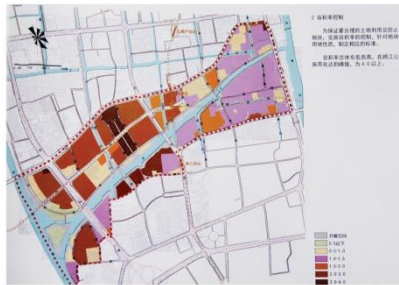


Figure 20. Floor area ratio



Figure 21. Concept plan



Figure 22. Bird eye view

Vernacular housing in Suzhou

Double chessboard is a typical layout for the living tradition in Suzhou. A cluster of housing usually faces a street in front (towards south) and backs to a waterway (towards north). Each family lives in a long and narrow row house which has a structure of “Yuan”, “Luo” and “Alley”. “Yuan” means the vertical unit with a courtyard, and “Luo” is the horizontal unit. “Alley” is a path to connect the street and the waterway, which is usually 1.2-2m wide (figure 23)³¹.

The front gate opens to the street for convenient circulation, while the rear gate opens to the waterway, for shipping, shopping and washing. Every family is connected by several Yuans.

³¹ Yu, Shengfang, “Of Suzhou Residential Building.” *Architectural Journal*, 1990, 36-44.

Every Yuan has a courtyard for good sunlight and ventilation. A small family has only one or two Yuans while a big family could have five, six or seven Yuans (figure 24)

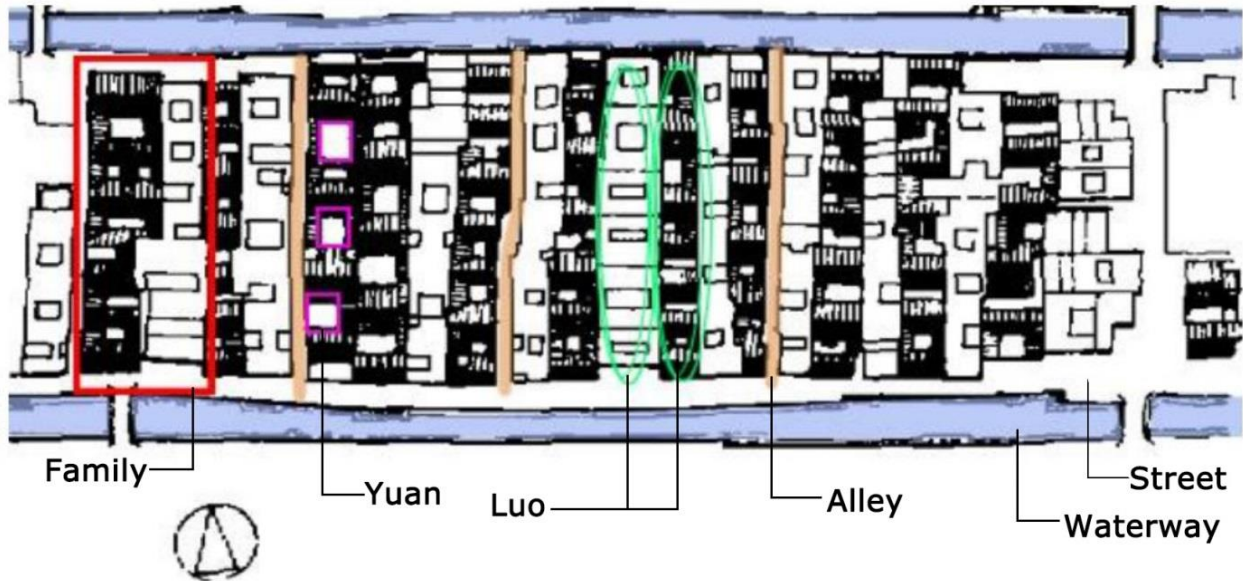


Figure 23. Double chessboard layout

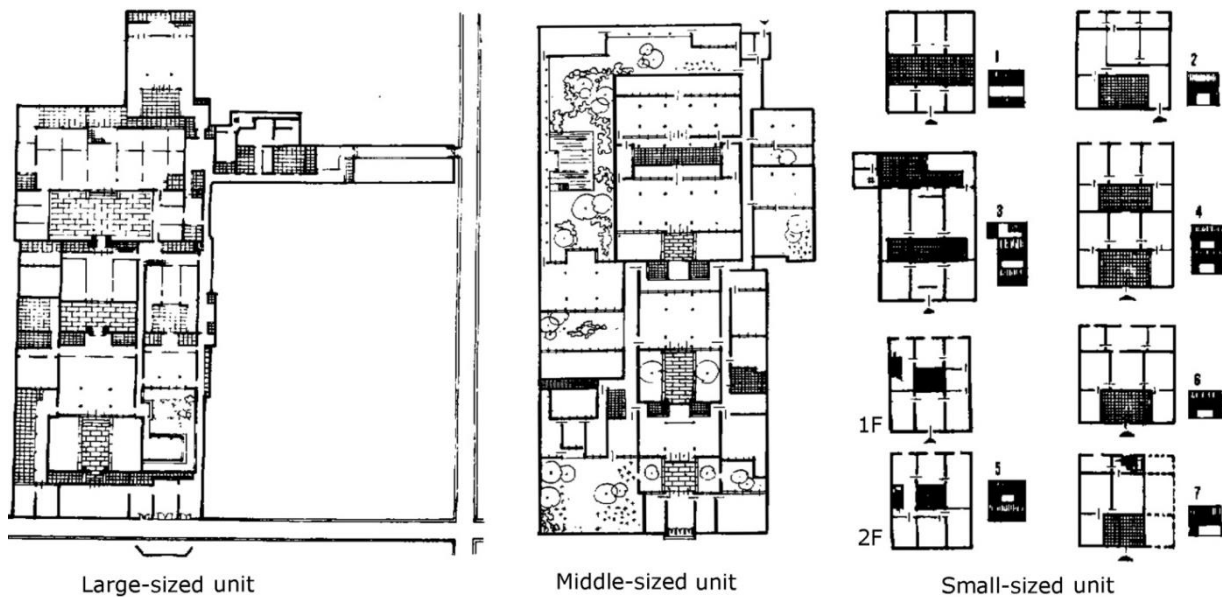


Figure 24. Examples of different sized units

Large-sized families usually have a private garden inside their housing. Symbolism is often used to create the garden spaces. For example, a stone is often symbolized as a mountain in a

small space; and combined with several old pines this space is given an open prospect. Often, though the space is confined, it can provide infinite imagination. Culture is also deeply injected into the garden. Poetic couplets and horizontal inscribed boards can often be seen on a pavilion or inside a hall. The pavement in the garden often has some lucky patterns. Wood and brick carvings are delicate enough to be perceived as art treasures (figure 25).



Figure 25. Cultural embodiments

Source:<http://www.worlduc.com/blog2012.aspx?bid=1567371>;
<http://greatlandlord.blog.163.com/blog/static/1618958962014313111416475/>; <http://www.ywxzd.com/>

Site analysis

Based upon the government planning document, a residential site was chosen in the “culture preservation area” (figure 26), numbered 01-04. This residential area is 3.65 hectares, where the land-lost farmers live. They don’t have good environment and infrastructure. Their living situation needs to be improved. The height of buildings in this planning area is supposed to be 12 meters to 150 meters (from 4 to 50 stories)—thereby increasing the density and having a larger group of residents. According to figure 19 there will be four to six storied residential buildings for those people. Hanwang Temple is also considered in the planning

document (figure 27). Hanwang Temple is a historical building to commemorate a war general called Han Shizhong, living from 1089-1151 in the Song Dynasty. There will also be a 1,000 square meters square built in front of the temple with a gateway, so people can visit this historical site which should be well preserved but has nearly been forgotten today.

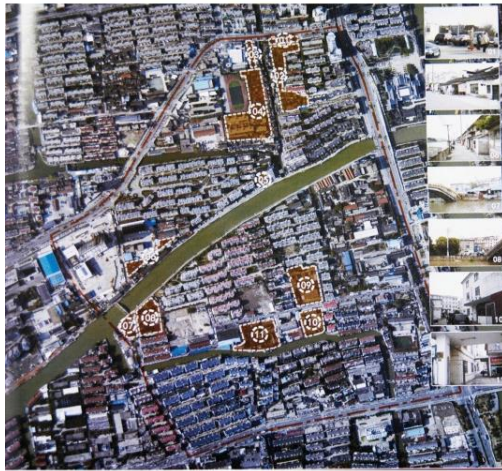


Figure 26. Reconstruction area



Figure 27. Plan for Hanwang Temple square

There is a canal going through this site which reaches to the Xu River. However, the canal is badly polluted and needs to be cleaned up. Though it is narrow, it could be an important landscape element in this neighborhood; and if it is cleaned up in the future, it could be a positive attraction for people. The buildings are not in good condition and they are being torn down to be replaced with new higher residential buildings. From the existing buildings, as the site photos show, we can tell the traditional buildings are one or two stories and they have courtyards (figure 28). The farmers who are still living here have a tendency to grow food on vacant lots. They should be encouraged to keep these garden areas, which could ease the

financial strain of land-lost farmers. They also have a tendency to hang their clothes in outdoor space, because they believe the ultraviolet rays from the sun will kill bacteria and viruses. Generally speaking, current living conditions are poor and need immediate improvement, and there is a great contrast between the new and old buildings in the area.



Figure 28. In-site situation

The residential developments adjacent to both the east and the south have six storied buildings. Some residential buildings in the north are more than twenty stories high, and the trend is that the high rise will be prevalent in the future. Laodong Road is a main street adjacent to the north and it turns southwest (figure 29). The road brings heavy traffic and there are some businesses along it – restaurants, retails, hotels, and bookstores. There is a farmer’s market to the northwest of the site and it is a convenient place for people to buy

fresh vegetables and other agricultural products. To the west there is an education institute run by the government and on the other side of Laodong Road to the west there is a primary school (figure 30, 32). There are three streets connecting this site with the urban streets, and there is a possibility to use them as the site entrances. Some historic features are distributed in the surrounding area. As figure 31 shows, there are two old bridges (marked as E & C), a museum (marked as A), an old temple (Hanwang Temple, as mentioned before, marked as F), an old town gate (marked as D), and Suzhou Urban Planning Exhibition Hall (marked as B). To sum up, this is a historic area, mainly for residence with education facilities and some commerce.

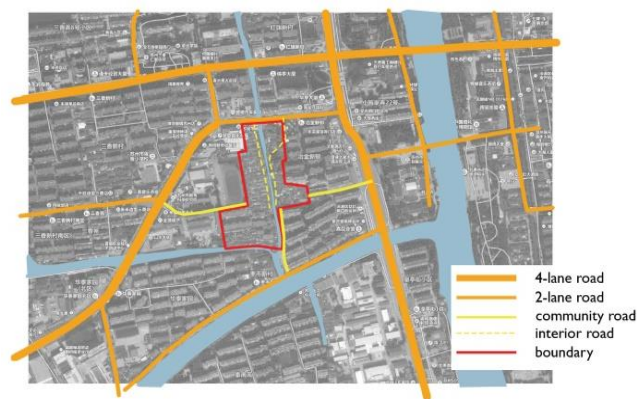


Figure 29. Surrounding circulation

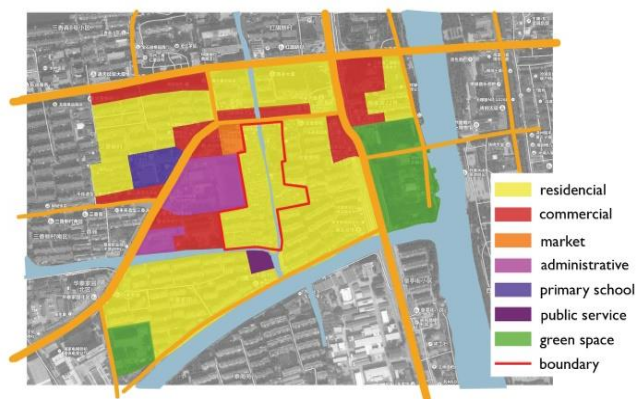


Figure 30. Surrounding land use

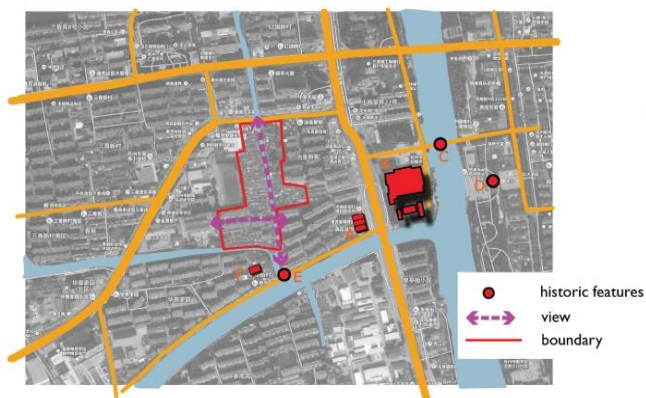


Figure 31. Views and historic features

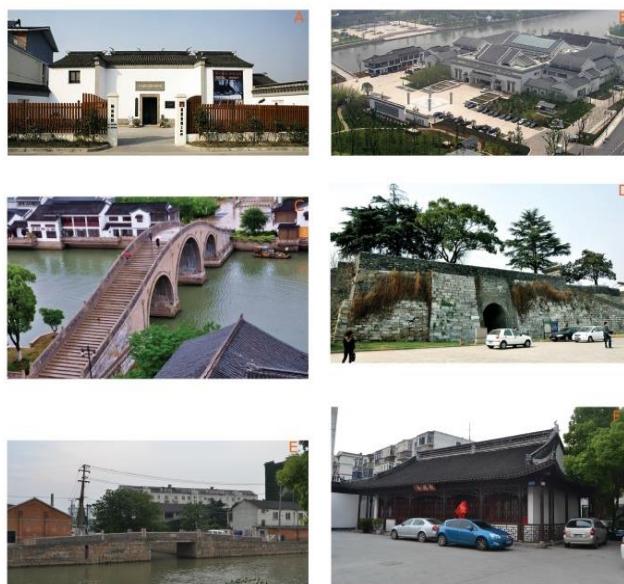




Figure 32. Surrounding context

IV. A PATTERN LANGUAGE

In *A Pattern Language*, published in 1977, Christopher Alexander and his coauthors describe problems which widely exist in our environment, such as those related to towns, neighborhoods, houses, gardens and rooms; and they provide related solutions at the same time³². The book lists 253 design patterns in total. Each pattern serves as a solution to a problem in a certain context or situation. Explanations are provided to support the pattern: statistical data; scientific analysis; discovering the simultaneous occurrence of this pattern in totally different cultures; psychological, structural, or cultural reasons; and so on³³. And each pattern ends with some sort of prescription in practical terms, to help incorporate the pattern into an actual design³⁴. The above demonstrates the compositions of a single pattern. All patterns together follow a linear sequence -- starting with largest section and ending with details of construction. That means each pattern connects to a larger pattern and is followed by a smaller pattern. This is how the language is systemic and coherent.

However, this book has always been very controversial. First, according to Saunders³⁵, Alexander's goal is too subjective and unilateral. Alexander refused to think about architecture in a different way and assumed that he knew people's needs. But some people may not share his values. Second, some of his ideas are too utopian; he thought human nature and needs are

³²Alexander, Christopher, Sara Ishikawa, and Murray Silverstein, *A Pattern Language*. New York: Oxford University Press, 1977.

³³⁻³⁴Salingaros, Nikos A. "The Structure of Pattern Languages." *Theory*, 4, 2000, 150.

³⁵Saunders, William S. "A Pattern Language," *Harvard Design Magazine*, 16, 2002.

unchangeable.

There are competing values in a society—communities are not always homogenous. People have to accommodate strangers and acquaintances, to compromise with new situations, such as natural disasters. Human nature and needs do change. Saunders also contends some of his observations are exaggerated and overblown. And that, the logic of his study method used in the book is not rigorous. Alexander and his co-authors assert that *A Pattern Language* is a recipe book that can be used in toto and the whole created is greater than the sum of its parts. However, the parts crowd and conflict with each other, resulting in fragmentation and hodgepodge.

Even though there are negative reviews of this book, the book does have some strong points. This book provides positive insights in its details. Since Alexander paid attention to particular daily experiences, this book is lively, spontaneous, and abundant with quickly sketched, informed intuitions. Every crafted detail produces a certain kind of beauty that could be felt in unexpected nooks and crannies. Some design ideas are valuable and should be accepted and promoted, such as his ideas about town making. Moreover, the patterns (number 350, 610, 628, 831) reveal a dialectical phenomenon – “people have opposite needs that should both be satisfied, needs for being public and private, with others and alone, casual and formal, intimate and detached, sheltered and out in the open.”³⁶ This suggests that spaces should have gradations and combinations between the extremes. This book serves a wide

³⁶ Saunders, William S. “A Pattern Language.” *Harvard Design Magazine*, 16, 2002, 6.

range of readers. Not only experienced architects will find this book useful because it provides reminders, but builders, developers, and homeowners could also be educated to design houses with more thought and care.

The book has a breadth of focus and supporting references. With the belief that the quality of architecture depends on the quality of life that it influences, Alexander expands his work to include psychology, anthropology, history, literature, sociology, and religion³⁷. And it's an impressive labor of synthesis. Although it has been criticized as based upon unconvincing research, over all it is affirmative of evidence-based design theories. Since Alexander developed the patterns based on the details in daily life shared by humanity, his theory is claimed to be universal and could be widely used all over the world.

Though people from different places have different cultures, customs and different values, they share common feelings and as well as some common needs. No matter rich or poor, a person needs to survive—water, food and shelter; no matter young or old, a person needs safety and security; no matter guilty or not, a person needs love and belongingness; no matter what background is, a person needs self-worth and self-esteem; no matter educated or not, a person needs to know and understand. And people are also born to have aesthetic needs and the need for self-actualization³⁸.

³⁷ Saunders, William S. "A Pattern Language." *Harvard Design Magazine*, 16, 2002, 6.

³⁸ Psychologist Abraham Maslow identified seven categories of basic needs common to all people. Maslow represented these needs as a hierarchy in the shape of a pyramid. From the bottom to the top are physiological needs, safety and security needs, love and belongingness needs, self-worth and self-esteem needs, need to know and understand, aesthetic needs and self-actualization needs.

When it comes to a specific aspect, such as creating comfortable spaces for users, some common design principles should be considered according to universal needs of humanity. Alexander studied these basic needs and did synthesized research to build his own theory, which has universality for urban planning, landscape design and architecture. For example, the pattern “Access to water” is proposed on the basis of people’s fundamental yearning of water bodies. “Pedestrian street” is proposed because people have a social attribute—they need social activities; and “Shopping street” is proposed based on people’s needs of comfort and convenience. Thus, his theory can be used in anywhere in the world.

A Pattern Language provides a lot of valuable ideas that could be used both as reminders for professional architects or guidelines for people uneducated in design. The breadth of the supporting references lays a foundation for thinking objectively and realistically and the dialectical thought for human’s opposite needs provides a full-scale insight to design considerations. In fact, many of his ideas have already been verified and widely accepted.

For example, this book influenced new urbanists Andrés Duany and Elizabeth Plater-Zyberk. Duany has publicly said that his wish for the Congress for New Urbanization (CNU) was to emulate the content of *A Pattern Language* and plug it into the existing context³⁹. Duany shares the same concern with Alexander et al. that modern technologies create a new human condition to which architecture must respond. And he follows the same core of principles—the human habitat that have been identified by Alexander as timeless and

³⁹ CNU--Congress for the New Urbanism was founded in 1993 and Andres Duany is one of the cofounders.

cross-cultural. This can be found everywhere in their book *The New Civic Art*. When it comes to “Public Space,”⁴⁰ a dialectic thinking of public and private for people’s needs is presented. The “Perimeter Block Schemes”⁴¹ is related to “House cluster”⁴² in *A Pattern Language*. “Bar Building”⁴³ is similar to “Row houses”⁴⁴; “Building Orientation”⁴⁵ is relevant to “Indoor sunlight”⁴⁶; “Configuration of Buildings”⁴⁷ reflects the ideas of mixed households, degradation of publicness, and special care for the elderly from *A Pattern Language*.

However, Duany doesn’t blindly follow Alexander -- they have divergence of implementation of the shared ideas. Duany is pragmatic, while Alexander is idealistic and obsessively insists on the good and the humane. For example, *A Pattern Language* requires charismatic leadership⁴⁸ since Alexander wishes for a pure democracy where everyone can build the neighborhood, but Duany discerns that nowadays bureaucracy is eroding American culture and practically he thinks only elite individuals can better undertake the city’s reconstruction. Also, Duany resorts to a market that behaves like an organism and has the potential to become a vector of traditional knowledge. Though the market cannot reach the

⁴⁰ Duany, Andrés, and Elizabeth Plater-Zyberk. *The New Civic Center—Elements of Town Planning*. New York: Rizzoli International Publications, 2003, 149.

⁴¹ Duany, Andrés, and Elizabeth Plater-Zyberk. *The New Civic Center—Elements of Town Planning*. New York: Rizzoli International Publications, 2003, 264.

⁴² Alexander, Christopher, Sara Ishikawa, and Murray Silverstein, *A Pattern Language*. New York: Oxford University press, 1977, 197.

⁴³ Duany, Andrés, and Elizabeth Plater-Zyberk. *The New Civic Center—Elements of Town Planning*. New York: Rizzoli International Publications, 2003, 286.

⁴⁴ Alexander, Christopher, Sara Ishikawa, and Murray Silverstein, *A Pattern Language*. New York: Oxford University press, 1977, 209.

⁴⁵ Duany, Andrés, and Elizabeth Plater-Zyberk. *The New Civic Center—Elements of Town Planning*. New York: Rizzoli International Publications, 2003, 305.

⁴⁶ Alexander, Christopher, Sara Ishikawa, and Murray Silverstein, *A Pattern Language*. New York: Oxford University press, 1977, 614.

⁴⁷ Duany, Andrés, and Elizabeth Plater-Zyberk. *The New Civic Center—Elements of Town Planning*. New York: Rizzoli International Publications, 2003, 311.

⁴⁸ Katarxis № 3. “A Conversation with Andrés Duany.” Accessed July 28, 2014. <http://www.katarxis3.com/Duany.htm>.

benefits of slow adaptation and evolution as identified by Alexander's traditional patterns, this is a powerful transmitter of values.

Also, the language system is open-ended and people can create new patterns following the way Alexander et al. built these patterns. This mode has already been widely borrowed by computer programmers in the field of Human Computer Interaction (HCI), as well as other fields. For example, Dough Schuler discussed a global participatory project with the method of creating the patterns inspired by Alexander et al.⁴⁹ . I also create some patterns for my design according to the unique context of my site. For example, I will propose a pattern "Skill training" to let the unemployed farmers learn some skills from the community center to help them find a job.

A Pattern Language did have some impact on the literature of guidelines. The book *Housing As If People Mattered*⁵⁰ borrows the same idea of organizing the text. A keyword shorthand title, a boldfaced brief statement, a graphic illustration, and the following textual backup are very similar to the narration of a "pattern". What is advanced from the prototype is two more added parts—possible design responses and reference, making the structure more complete and convincing.

With respect to my site, I have selected some reasonable concepts to use in my design.

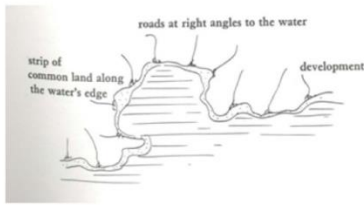
⁴⁹ Participatory Project is the construction of a large structured collection of knowledge that represents the "wisdom" of a widely distributed, very loosely knit community of activists, researchers, policy-makers, and technologists from around the world. Doug Schuler, "A Pattern Language for Living Communication—A Global Participatory Project." Paper presented at Proceedings of Participatory Design Conference, Malmo, Sweden, June 23-25, 2002.

⁵⁰ Marcus, Clare C., and Wendy Sarkissian. *Housing As If People Mattered*. Berkeley and Los Angeles, University of California Press, 1986, 14.

Inevitably there are some defects within *A Pattern Language* and I was selective in choosing the patterns. Since the language system is clearly from the larger context down through the detail principles, it's convenient to choose what patterns could be used according to the scale of my own site. And since every pattern has three elements—problem, context, and solution, it's flexible to apply a pattern into a specific context, because I could edit or revise the solution to make it applicable to the context. Figure 33 lists all the patterns I use in my design, some of them come from *A Pattern Language*, and some are newly created according to the site situation.

Access to water

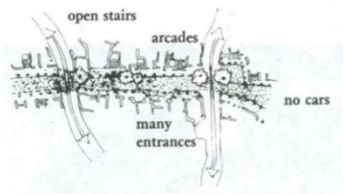
People have a fundamental yearning of great bodies of water. But the very movement of the people toward the water can also destroy the water.



When natural bodies of water occur near human settlements, treat them with great respect. Always preserve a belt of common land, immediately beside the water. And allow dense settlements to come right down to the water only at infrequent intervals along the water's edge.

Pedestrian Street

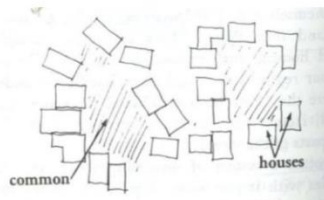
The simple social intercourse created when people rub shoulders in public is one of the most essential kinds of social "glue" in society.



Arrange buildings so that they form pedestrian streets with many entrances and open stairs directly from the upper stories to the street, so that even movement between rooms is outdoors, not just movement between buildings.

House cluster

People will not feel comfortable in their houses unless a group of houses forms a cluster, with the public land between them jointly owned by all the householders.



Arrange houses to form very rough, but identifiable clusters of 8 to 12 households around some common land and paths. Arrange the clusters so that anyone can walk through them, without feeling like a trespasser.

Shopping street

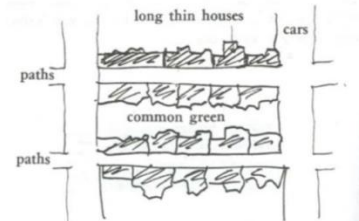
Shopping centers depend on access: they need locations near major traffic arteries. However, the shoppers themselves don't benefit from traffic: they need quiet, comfort, and convenience, and access from the pedestrian paths in the surrounding area.



Encourage local shopping centers to grow in the form of short pedestrian streets, at right angles to major roads and opening off these roads – with parking behind the shops, so that the car can pull directly off the road, and yet not harm the shopping street.

Row houses

At densities of 15 to 30 houses per acre, row houses are essential. But typical row houses are dark inside and stamped from an identical mould.



For row houses, place houses along pedestrian paths that run at right angles to local roads and parking lots, and give each house a long frontage and a shallow depth.

Four-story limit

There is abundant evidence to show that high buildings make people crazy.



In any urban area, no matter how dense, keep majority of buildings four stories high or less. It is possible that certain buildings should exceed this limit, but they should never be buildings for human habitation.

Figure 33-1. Design patterns

Parking ▲

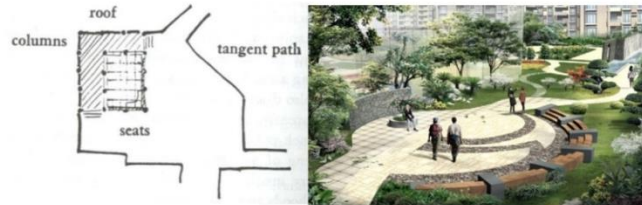
Cars, motorcycles, and bikes should be comprehensively considered in the community.



For car parking, do not allow more than 9 percent of the land in any given area to be used for parking. In order to prevent the "bunching" of parking in huge neglected areas, it is necessary for a town or a community to subdivide its land into "parking zones" no larger than 10 acres each and to apply the same rule in each zone. For motorcycles and bikes, there should be specialized parking area for people to park. The specific number of parking space should be related to how many residents living in the neighborhood.

Public outdoor room

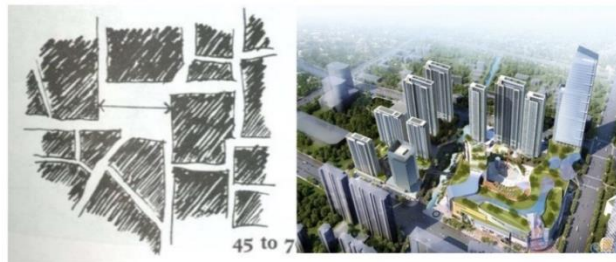
There are very few spots along the streets of modern towns and neighborhoods where people can hang out, comfortably, for hours at a time.



In every neighborhood and work community, make a piece of the common land into an outdoor room – a partly enclosed place, with some roof, columns, without walls, perhaps with a trellis; place it beside an important path and within view of many homes and workshops.

Small public square

A town needs public squares; they are the largest, most public rooms, that the town has. But when they are too large, they look and feel deserted.



Make a public square much smaller than you would at first imagine; usually no more than 45 to 60 feet across, never more than 70 feet across. This applies only to its width in the short direction. In the long direction it can certainly be longer.

Urban Garden •

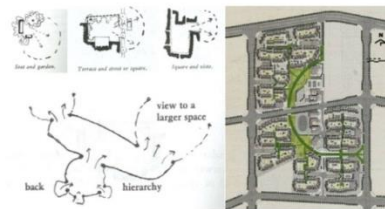
Urban garden is type of open space which is rather enclosed. It usually serves only the residents who are living around, sharing some common activities.



The urban garden should be more local, and more specific to reflect the local life style, living habit and does good to the residents adjacent.

Hierarchy of open space

Outdoors, people always try to find a spot where they can have their backs protected, looking out toward some larger opening, beyond the space immediately in front of them.



Whatever space you are shaping—whether it is a garden, terrace, street, park, public outdoor room, or courtyard, make sure of two things. First, make at least one smaller space, which looks into it and forms a natural back for it. Second, place it, and its openings, so that it looks into at least one larger space. When you have done this, every outdoor space will have a natural "back"; and every person who takes up the natural position, with his back to this "back", will be looking out toward some larger distant view.

Degrees of publicness

People are different, and the way they want to place their houses in a neighborhood is one of the most basic kinds of difference.

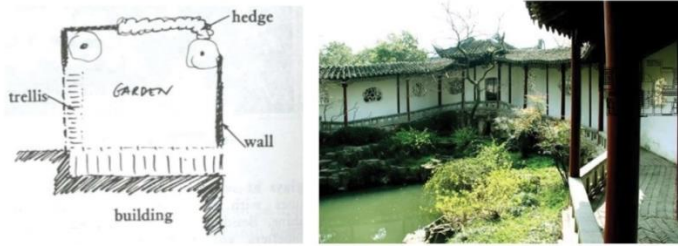


Make a clear distinction between three kinds of homes – those on busy streets, and those that are more or less in between. Make sure that those on quiet backwaters are on twisting paths, and that these houses are themselves physically secluded; make sure that the more public houses are on busy streets with many people passing by all day long and that the houses themselves are relatively exposed to the passers-by. The in between houses may then be located on the paths half-way between the other two. Gibe every neighborhood about equal numbers of these three kinds of homes.

Figure 33-2. Design patterns

Garden wall

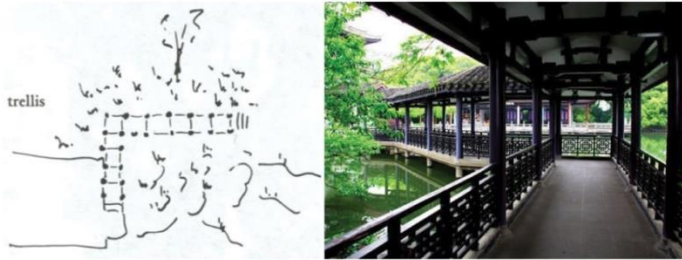
Gardens and small public parks don't give enough relief from noise unless they are well protected.



Form some kind of enclosure to protect the interior of a quiet garden from the sights and sounds of passing traffic. If it is a large garden or a park, the enclosure can be soft, can include bushes, trees, slopes, and so on. The smaller the garden, however, the harder and more definite the enclosure must become. In a very small garden, form the enclosure with buildings or walls; even hedges and fences will not be enough to keep out sound.

Trellised walk

Trellised walks have their own special beauty. They are so unique, so different from other ways of shaping a path, that they are almost archetypal.



Where paths need special protection or where they need some intimacy, build a trellis over the path and plant it with climbing flowers. Use the trellis to help shape the outdoor spaces on either side of it.

Color pattern

White, black, grey and maroon are the most predominant colors that should be used in the community design.



Typical features of traditional housing include the white walls, black roofs and maroon pillars. So the same set of colors should be used in the community design.

Traditional design language

In Suzhou classical gardens there are many ways to create a pleasant private space and these methods should be utilized in the community landscape design.



Framing the scenery, layering several spaces that are interpenetrative, borrowing far-away focal spot into the garden, illusion, metaphor etc... are all the typical method used in garden design.

Plants choice

Plants chosen for the design should be local, practical and considering the typical meaning of these plants.



Bamboo, magnolia, locust, and plantain are the typical plants. Other fruit trees like ginkgo, pomegranate, jujube, orange, and flowering trees like cherry, plum, peach are also common to see. Also there are some plants have a specific meaning in the traditional culture that should be pay attention to. Like the pines stands for keeping one's spirit forever, orchid stands for a man of noble character, or peony stands for richness and so on.

Ornament

All people have the instinct to decorate their surroundings.



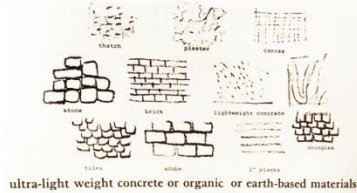
Search around the building, and find those edges and transitions which need emphasis or extra binding energy. Corners, places where materials meet, door frames, windows, main entrances, the place where one wall meets another, the garden gate, a fence—all these are natural places which call out for ornament.

Now find simple themes and apply the elements of the theme over and again to the edges and boundaries which you decide to mark. Make the ornaments work as seams along the boundaries and edges so that they knit the two sides together and make them one.

Figure 33-3. Design patterns

Good materials ▲

There is a fundamental conflict in the nature of materials for building in industrial society.



Use only biodegradable, low energy consuming materials, which are easy to cut and modify on site. For bulk materials it is suggested to use ultra-lightweight 40-60 lbs. concrete and earth-based materials like tamped earth, brick, and tile. For secondary materials, use wood planks, gypsum, plywood, cloth, chicken wire, paper, cardboard, particle board, corrugated iron, lime plasters, bamboo, rope, and tile.

Community center for the elderly •

The elderly need a place to get together and have regular activities together. Aged people need each other to talk, to share feelings to be accompanied.



Inside the community center there should be some space for the elderly to get together and have activities together. They can do sports together, rehearse together, play chess and cards together or share some other common interests together. That's not only benefit to their physical health, but have positive effect on their mental health.

Senior co-housing ▲

There can be some specialized households in the community for the elderly to live together with each other and take care with each other in their daily life.



A house or a set of apartment could live several aged people from different families. They share the same living room, the same dining room, and the same kitchen. So the aged people who are single can live together without any loneliness. Even those aged people who do have a family could choose to live in such a household to avoid the inconvenience with the young generations.

Skill training •

There should be some training classes within the community to help the land-lost farmers to get new jobs. Several classrooms could be built inside the community center for people to have some skill-training classes. Anyone can offer a class and anyone can take a class. There could be a library inside the community center for people to read books.

Figure 33-4. Design patterns

V. APPLICATION OF DESIGN PATTERNS

There are twenty-two patterns used in this design—ten patterns come from *A Pattern Language* without any change, six patterns come from the same book but with some revisions, and six are created by me according to the real situations and constraints. These patterns could be divided into three categories – twelve Planning principles, seven Landscape design principles, and three Social program principles. Figure 34 lists detail information of these three categories. Revised patterns are marked with a “▲” and the new patterns are marked with a “●”.

	directly used patterns	revised patterns ▲	new patterns ●	number
Planning principles	8 Access to water Pedestrian street Row houses Four-story limit Public outdoor room Small public square Degree of publicness Hierarchy of open space	3 House cluster Shopping street Parking	1 Urban garden	12
Design principles	2 Garden wall Trellised walk	2 Oranament Good materials	3 Color pattern Plants choice Traditional design language	7
Program principles		1 Senior co-housing	2 Community centre Skill training	3
number	10	6	6	22

Figure 34. Patterns for the site in Suzhou

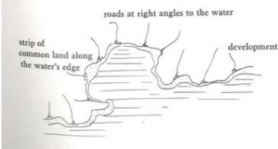
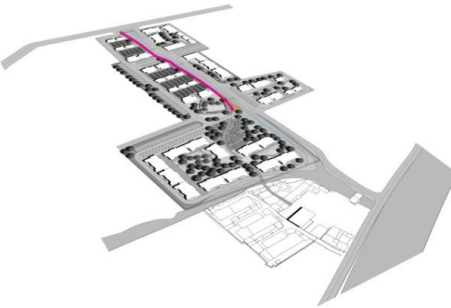
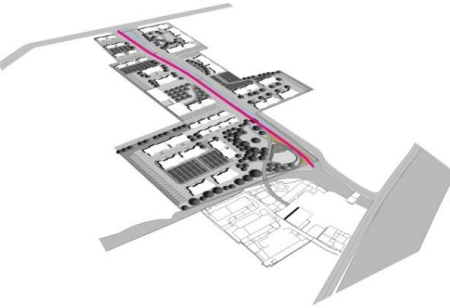

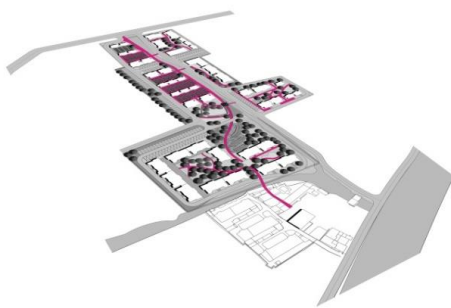
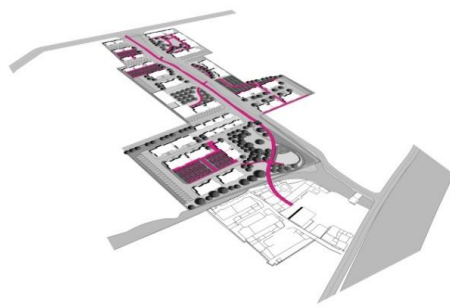
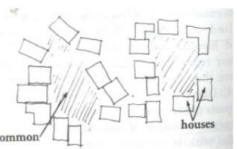


pattern	site plan I	site plan II
<p>Access to water</p> <p>People have a fundamental yearning of water bodies. Great respect should be treated to the natural bodies of water when applying a belt of common land to human settlements.</p>  <p>There will be a broad walkway along the canal going through the site. And several bridges will be built over the canal to connect the two parts separated by the canal.</p>		
<p>Pedestrian Street</p> <p>The simple social intercourse created when people rub shoulders in public is one of the most essential kinds of social "glue" in society. The interactions between the buildings and the pedestrian street will provide outdoor movements.</p>  <p>There is a hierarchy of pedestrian streets in the site design--from the walkway along the canal which is the most open one to the secondary open walkways that go through the community park, neighborhood park, public square and the community garden, finally to the relatively private walkways located in the linear space between buildings.</p>		
<p>House cluster</p> <p>People will not feel comfortable in their houses unless a group of houses forms a cluster, with the public land between them jointly owned by all the householders.</p>  <p>There will be some houses clustered together to form a central public space in the site design. The layout of the clusters could be U-shaped, O-shaped or analogues of these two shapes.</p>		

Figure 35-1. Application of design patterns

Planning principles

In planning principles, there are twelve patterns—eight patterns are directly borrowed from the book, three patterns are revised and one pattern is newly created:

I. Since people are born having a yearning to get closer to water and a canal goes through the site, a broad walkway needs to be added along the canal to provide a public space for people to access water.

II. As one of the most essential kinds of social “glue” in the society⁵¹, a main pedestrian path can go through the whole site from the north to the south boundary and it will connect the old temple square at the southern end. Some secondary pedestrian paths may extend from the main path to the urban garden, neighborhood park, community park and other types of open space.

III. Since the city used to have a lot of canals parallel with the streets, there was a “double chess board” layout of the city’s housing arrangement from the 12 century B.C. to the 1970s. So “Row houses” has become a typical layout of residential buildings.

IV. Even though four-six storied buildings were planned by the local government, the "Four story limit" should be followed for the elderly, one-sixth of population in this area.

⁵¹ Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. *A Pattern Language*. New York: Oxford University press, 1977.

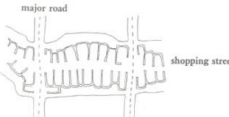

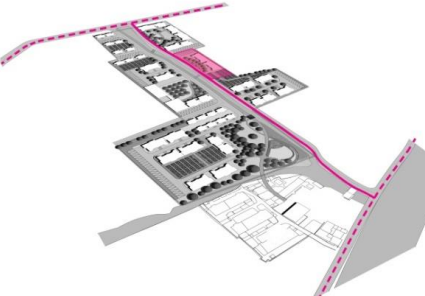
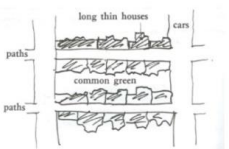
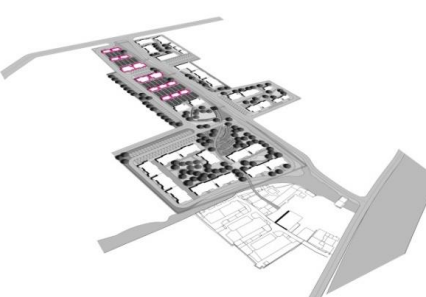
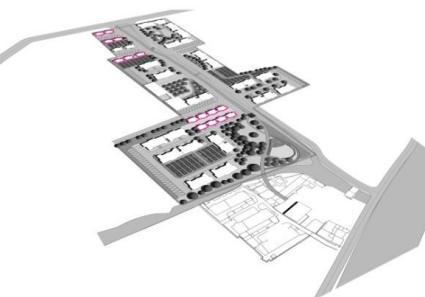

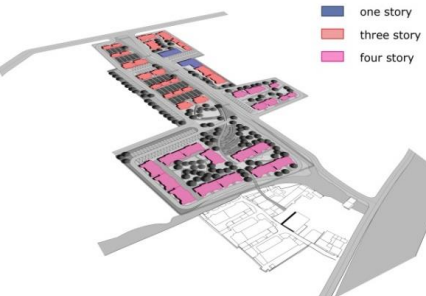
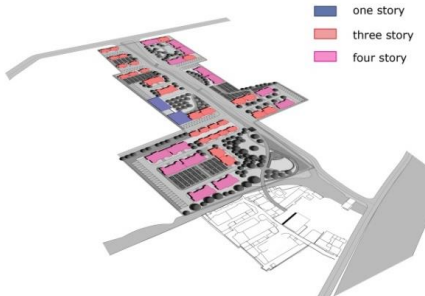
pattern	site plan I	site plan II
<p>Shopping street</p> <p>Shopping centers depend on access: they need locations near major traffic arteries. However, the shoppers themselves don't benefit from traffic: they need quiet ,comfort, and convenience, and access from the pedestrian paths in the surrounding area.</p>  <p>Shopping street is applied into the site because there is a possibility to develop a vehicle street with pedestrian pathway along the canal that connects the two major city streets in the north and in the south of the site.</p>		
<p>Row houses</p> <p>For row houses, place houses along pedestrian paths that run at right angles to local roads and parking lots, and give each house a long frontage and a shallow depth.</p>  <p>Row houses are also a typical layout of residential buildings in Suzhou's tradition. Because they city used to have a lot of canals parallel with the streets, there was a "double chess board" layout of the city's housing arrangement from 12 century B.C. to the 1970s.</p>		
<p>Four-story limit</p> <p>High buildings make people crazy. And four-story requirement is based on human habitation. This also goes with the tradition in Suzhou that the residential buildings were no more than 4 stories.</p>  <p>In the site design, community center and senior co-housing are one storied. Some of the residential buildings are three storied while the others are four storied.</p>	 <p> ■ one story ■ three story ■ four story </p>	 <p> ■ one story ■ three story ■ four story </p>

Figure 35-2. Application of design patterns

V. A common partly enclosed place with some roof, columns, or a trellis in a neighborhood could be the “Public outdoor room”. The specific type in this design will be the community park with a veranda, the neighborhood park with tree canopies, a broad walkway with some roof structure.

VI. “Public square” is the largest, most public room in a town and the width should be no more than 45-60 feet across, and never more than 70 feet across. In this project, the public square will be located in different types of open space—it will be in a community park or a neighborhood park.

VII. For buildings there should be “Degree of publicness” according to people’s different characters and the buildings should be localized carefully to realize such pattern. The shops and the community center are more open to the public, so they will be located besides the most open spaces. Since the elderly can easily feel lonely, the senior co-housing should be located besides the semi-open space such as a playground or the open space such as the public square. As for other residential buildings, they should be located in different gradations of open spaces to form this pattern.

VIII. In fact, “Degree of publicness” and the pattern “hierarchy of open space” have a figure-ground relationship. “Hierarchy of open space” is mainly about how to create open spaces with a hierarchy of publicness. In this site, there are five types of open spaces—community park, neighborhood park, small square, urban garden and the linear open

space between buildings. They have a gradation from very open to very private as a whole system.

The three patterns with revisions in the planning principles category are “House cluster”, “Shopping street”, and “Parking”.

IX. People feel ownership when there are “House clusters” with a common land shared by all the householders. However, because the site is separated into two pieces of narrow land by the canal, there may not be enough space to include 8-12 householders as suggested in *A Pattern Language*. So this design has smaller house clusters. The layout of the clusters can be U-shaped, O-shaped or combinations of these two shapes.

X. “Shopping street” is applied to the site because there is a possibility to develop a vehicle street with pedestrian pathway along the canal that connects the two major city streets in north and south. However, because of the land constraint, the shopping street could only be a vehicle pathway.

XI. The pattern “Parking” is revised from the original pattern “Nine per cent parking”. In the original theory, Alexander et al. only considers car parking; however, bike parking and motorcycle parking should also be included in the consideration for my site, because the car is not as popular as in western countries. Within the community, the parking area should be subdivided into several parking zones, and these parking zones should be in line with the circulation.

XII. The last one categorized in this level is a newly created pattern “Urban garden”. Inspired by Alexander’s assertion that the garden should be a part of the natural growth, I do believe that urban garden should be shaped by the existing situation and by a historic precedent. So considering the farmers tradition and their hard living situation, the gardens here should be productive. They should be vegetable gardens for the land-lost farmers to keep their growing habit so that their income will be supplemented by selling the garden produce.

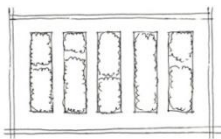
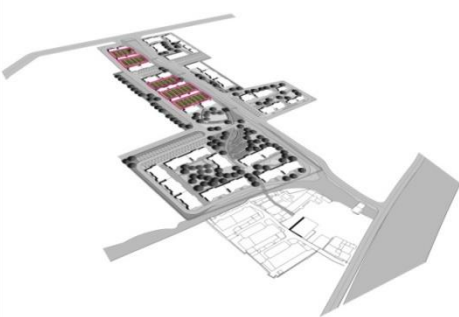
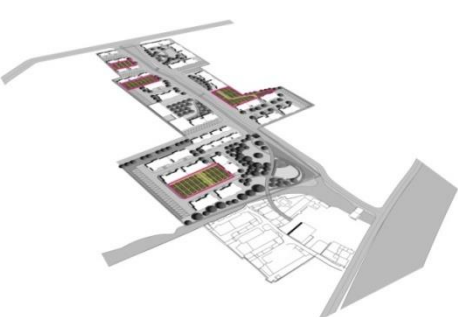
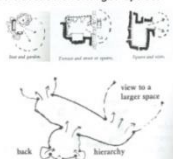
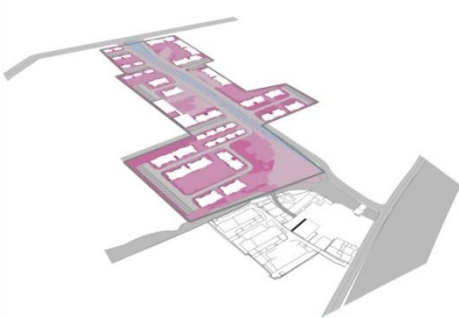
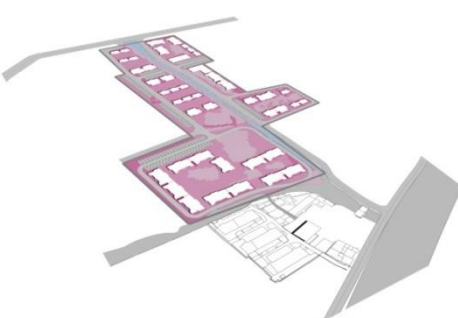



pattern	site plan I	site plan II
<p>Urban Garden</p> <p>Urban garden is type of open space which is rather enclosed. It usually serves only the residents who are living around, sharing some common activities. The urban garden should be more local, and more specific to reflect the local life style, living habit and does good to the residents adjacent.</p>  <p>Following the farmers tradition and their living situation, the gardens in the site will have a unique function of production. It's more like vegetable gardens for the land-lost farmers to keep their growing habit and also they could have a relief on the living cost.</p>		
<p>Hierarchy of open space</p> <p>There are two attentions for making an open space. First, make at least one smaller space, which looks into it and forms a natural back for it. Second, place it, and its openings, so that it looks into at least one larger space.</p>  <p>Generally there are 5 types of open spaces within the site plans--community park, neighborhood park, small square, community garden and the linear open space between buildings. They have a gradation and combination of the open degree from very open to very private as a whole system.</p>		
<p>Degrees of publicness</p> <p>For buildings there should be degrees of publicness according to people's different characters and the buildings should be localized carefully to realize such pattern.</p>  <p>Actually this pattern and the previous one "Hierarchy of open space" are in a relationship of figure--ground. Generally speaking, the buildings that are closer to the more open spaces are more public while the buildings that are closer to the more enclosed open spaces are more private.</p>	 <p>private semi-private semi-public public</p>	 <p>private semi-private semi-public public</p>

Figure 35-4. Application of design patterns

Landscape design principles

Seven patterns are applied at the landscape design level—two patterns directly from *A Pattern Language*, two revised patterns, and three newly created patterns.

I. The two directly used patterns are “Garden wall” and “Trellised walk”. “Garden wall” is applied to protect the gardens and small parks to keep away the outside noise and demarcate the site. In the site design, buildings, walls, hedges and trellis will be used to form the garden wall.

II. “Trellised walk” is a special way of shaping a path with overhead protection. A veranda or a trellis with climbing plants will be used in this site to create an in-between space — a dual area with openness and enclosure.

III. “Ornament” and “Good materials” are selected from *A Pattern Language*. “Ornament” is usually showed in details, and it adds to the aesthetics. For this site, the ornament could be tile carving at the gateway, wood carving on the windows, color painting under the veranda roof and so on.

IV. “Good materials” may be natural materials that are biodegradable or low energy consuming, which are easy to build with on-site. There are many choices based on different purposes. Concrete or earth-based materials could be used as bulk materials for buildings, or the pavement on the street. Some traditional materials like the tile, the gravel, or bamboo wood could also be used in outdoor landscapes. These two patterns are in a detailed design

level beyond site design level of this project.

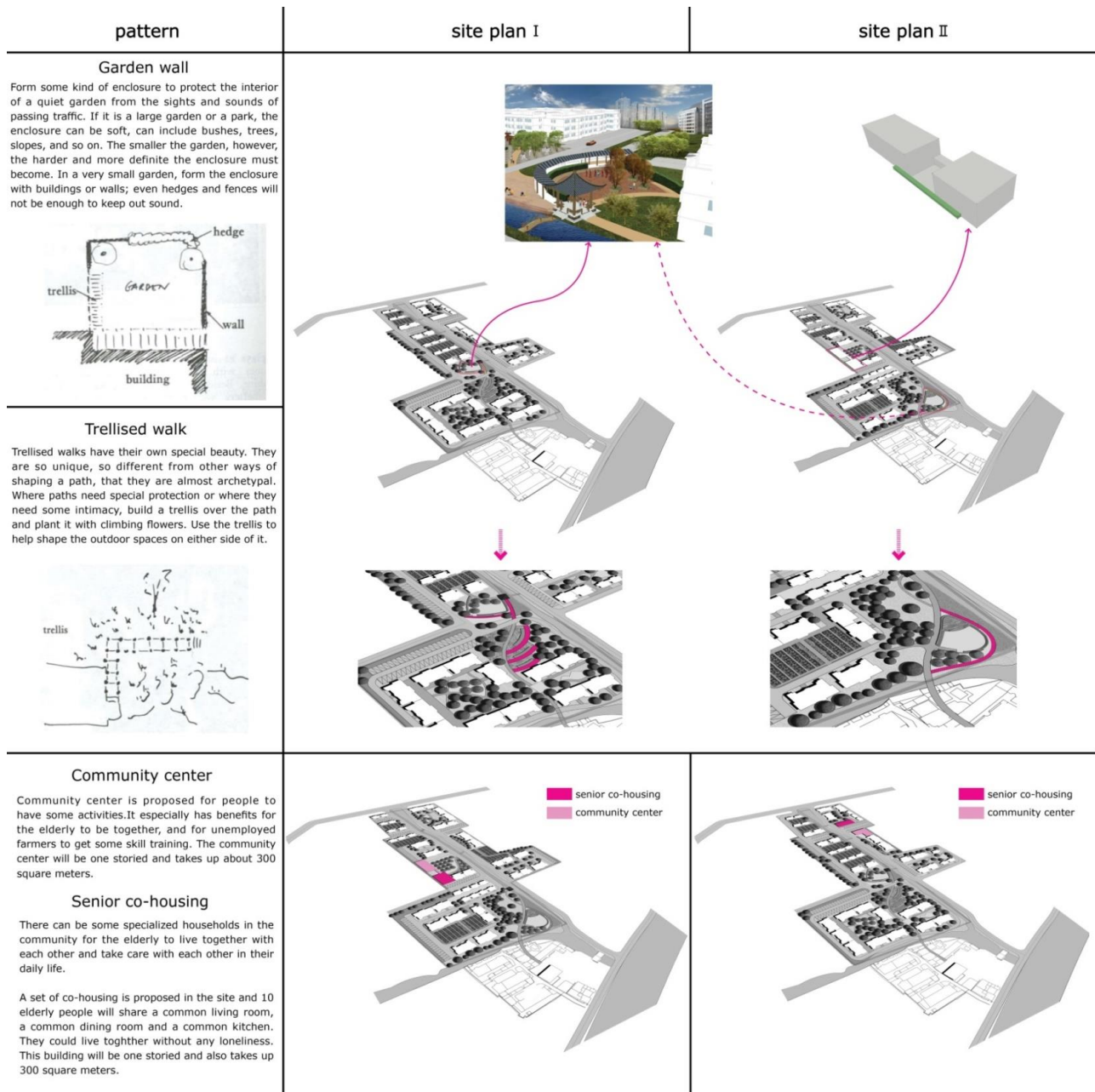


Figure 35-5. Application of design patterns

V. The remaining three new patterns are “Traditional design language”, “Color pattern”, and “Plants choice”. Since Suzhou is an old town with more than 2000 years of history, traditional and historic elements cannot be ignored. “Traditional design language” is more of a reminder to help designers keep in mind that the traditional design methods and some typical landscape intentions should be considered carefully and expressed in a modern way. These methods include framing the scenery, layering several spaces that are interpenetrative, borrowing far-away views into the garden, illusion, metaphor and so on. Within the traditional design language in Suzhou, color and plants are the two relatively dependent elements which are easier to apply.

VI. “Color pattern” refers to the tradition of using the most predominant colors—white, black, grey and maroon. Typical features of traditional housing include the white walls, black roofs, and maroon pillars. These four colors will also be used as the main colors in the project designs.

VII. As for “Plants choice”, typical plants with a local habitat, or a traditional meaning should be considered first. For example, bamboo, magnolia, locust, and plantain are very common in Suzhou. Fruit trees like ginkgo, pomegranate, jujube, orange, and some flowering trees like cherry, plum, peach are also typical trees. Plants with cultural connotation include pines—they symbolize keeping one’s spirit forever; orchid-- for a man’s noble character or peony-- for richness.

Program principles

At the program principle level, three patterns are applied in the site design—one revised pattern “Senior co-housing”; two new proposed patterns “Community center for the elderly” and “Skill training”.

I. “Senior co-housing” is inspired from “Old people everywhere” in *A Pattern Language*. The original pattern explains that “there is a natural tendency for old people to gather together in cluster or communities”⁵². And it suggests that a neighborhood of 50 old people should be built. But in this site such a neighborhood is not possible, because the elderly usually would like to live together with their children and only the single elderly will have motivation to join the co-housing life. So co-housing for 10 senior people living together is more reasonable and applicable. The elderly will share the living room, dining room, and kitchen.

II. A community center is also proposed for the elderly to have a place to get together and have regular activities together. They could do sports, rehearse, and play chess and cards. This “Community center for the elderly” not only benefits their physical health, but has positive effect on their mental health as well.

III. “Skill training” is aimed to help the unemployed farmers to learn some new employment skills. Several classrooms could be built inside the community center for people to have some skill-training courses. Anyone can offer a class and anyone can take a class. Also there could be a library inside the community center for people to do some reading and self-study.

⁵² Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. *A Pattern Language*. New York: Oxford University Press, 1977.

VI. SITE PLANNING

Sanxiang New Village is a large residential parcel adjacent to the study site of this project. It was completed in 1979. Before the 1978 reform and opening-up policy, the residential buildings were one-storied house clusters, surrounded by large area of farmland. And there were also canals and woods dispersed throughout. However, drastic industrialization destroyed such calming features and brought in the six-storied row houses. From the aerial photo of this site (figure 37), it's clear to see that all the buildings are arranged in a tedious and monotonous tone. Also, there is not enough open space outside the buildings, let alone the hierarchy or gradation of publicness. This kind of residence used to be the mainstream from the 1980s and until recently it took up a large portion in the real estate market.

The new policy gave the city a good opportunity to develop rapidly and the entire society was anxious to achieve quick success and get instant benefits. So the process of urbanization has been accelerated and large pieces of farmland have been taken away, and the rebuilt residential developments for the land-lost farmers are not designed as people places. After more than thirty years since the new policy was implemented, designers and government officials have started realizing social problems resulting from unreasonable planning and design projects.

Sanxiang New Village -- Traditional residential lot for land-lost farmers

Completed time: 1979
Height: 6 stories



Before 1978



After 1979



"Good view" residence design-- Current residential lot for land-lost farmers

Completed time: 2013
Height: 3, 24, 25, 26, 27 stories



Figure 36. Typical site plans

From the projects completed within the recent five years, there have been revisions and improvements in residential design. The example showed in figure 36 gives some clues. The “Good View” residential design project is located in Suzhou, and was completed in 2014⁵³. Parts of the residential buildings are for the land-lost farmers. Most of the buildings are three storied, but the buildings at the northern, western and eastern edges are high-rises which are 24-27 stories. It’s an improvement that the “Four story limit” is followed, however, the high-rises are not recommended. The gigantic buildings are abrupt and not in harmony with the three-storied buildings and the buildings outside the residential development. This is because the residential buildings are market-oriented and the developers pursue only economic profits. However, more considerations based on social-psychological concerns should be included and only in that way, some social problems could be relieved by planning and landscape design. For this project, site design considerations are based on the requirements and habits of the land-lost farmers.

Project site plans

This proposed housing project is for 600 land-lost farmers. Fifty-five of them are under 14 years old, 98 are the elderly, and 447 are adults⁵⁴. As per the land compensation from the government, each displaced person could get 30 square meters housing compensation, and most families have only one child, so three types of housing units are designed (figure 37). For

⁵³ Yong Li, “Suzhou real estate.” Accessed July 15, 2014. http://su.fzg360.com/news/201401/35979_all.html

⁵⁴ The total number 600 comes from the local government city planning document. The demographic composition of this site is conjectured according to the city’s overall demographic composition.

single individuals, there are 102 sets of 30 square meters housing; 60 sets of 60 square meters housing are for couples; 123 sets of 90 square meters apartments are for families of three people. Besides, one co-housing (300 square meters) shared by 10 senior people is also proposed, as well as a 300 square meters community center. The floor area ratio of this site is 0.5, and there are one storied, three-storied and four-storied buildings. Since the design patterns can be applied repetitively and flexibly, different site plans can be generated with the same patterns. Here are two possible site plans practicing the pattern language.

Area: 3.65 hectares

Planned stories: 1, 3, 4

People: 600
55 youth (<14)
447 adult
98 elderly

30 m² --- 102

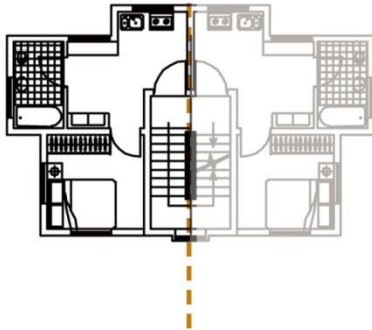
60 m² --- 60

90 m² --- 123

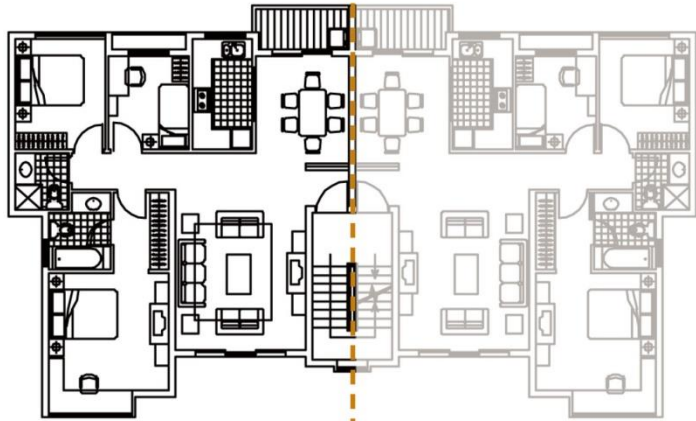
Co-housing --- 1

Community center --- 1

30 square meter



90 square meter



60 square meter

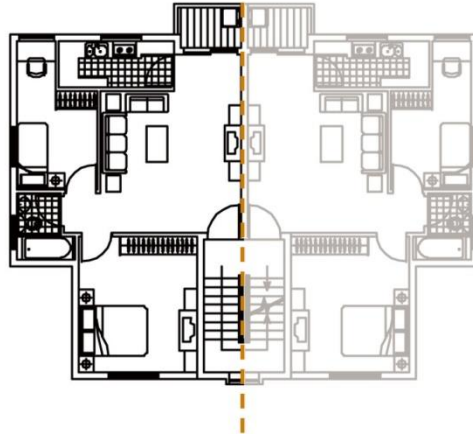


Figure 37. Residential building plans

Site plan I

The first site plan has a loop-structured circulation. The main vehicular road goes along the canal, connecting the city road in the north and the south. The other main vehicular road goes from the west boundary up to the north, connecting the commercial activities in the west and the city road in the north. Attached to these two major roads there are two loops, formulating the secondary one-way circulation. Since the northern part of the site is linear and there is not enough space to make loops, two secondary end type roads are provided for circulation. Totally there are 135 parking lots, dispersed in the site, along the vehicular roads. The parking area takes up 7.15% of the site area.



Figure 38. Concept of Site plan I

Site plan I



Figure 39. Site plan I

In the east part of the site, along the main road are commercial-combined residential buildings—the first stories are retail shops and the second and the third stories are residential apartments. Together with these retail shops is the community center, which is also open to the public. The senior co-housing is located in the north beside the playground, where the elderly can often see children play. The other buildings are residential apartments, which are three or four storied and mixed in the arrangement. The composition of the buildings is shown in figure 40.

	30 m ²	60 m ²	90 m ²	Other	Total
Four storied	4	3	13		20
Three storied	12	6	3	2 [▲]	23
One storied				2 [●]	2
Total	16	9	16	4	45

▲ There are two commercial-combined residential buildings which are also three-storied.

● Both the senior co-housing and the community center are one storied and 300 m².

Figure 40. Composition of the buildings in site plan I

There are three house clusters in this plan. One is in the north, east to the canal. Seven buildings enclose a neighborhood park. Besides the senior co-housing, the other six buildings are all three-storied—three are 90 square meters apartment buildings and three are 30 square

meters apartment buildings. The second house cluster is in the southeast, mixed with three four-storied 30 square meters apartment buildings, three four-storied 60 square meters apartment buildings and one four-storied 90 square meters apartment building. The last one is designed with eight four-storied 90 square meters apartment buildings, and they form a neighborhood park inside the cluster. It's located in the southwest, adjacent to the canal. Besides the house clusters, other buildings are arranged as row houses in the west.

Different types of open spaces are provided and combined with a gradation of publicness. In the middle of the site is located the community park, which is most open. A public square inside the park is for people to get together and have some collective activities, like doing Tai Chi, or dancing. A pavilion and a trellised walkway are also proposed to give people a feeling of protection and intimacy. Besides, as a typical structure in Suzhou classic gardens, white walls with large openings are also used to divide the landscape into different layers. Along the canal, a sand beach is proposed for people to have a direct access to water and little kids to play (figure 41). Outside the retail shops, there is a linear public square along the main road, which can also be used as outdoor seating area (figure 42). The neighborhood park in the north is a semi-open space. A children's playground with some facilities is proposed here (figure 43). In the southwest and southeast there are another two neighborhood parks, also semi-open, serving the residents living around them. Five community gardens are located in between the row houses in the west. The land-lost farmers can grow vegetables here in keeping with their growing habit and at the same time can supplement their income (figure 44).



Figure 41. Community park



Figure 42. Shopping street



Figure 43. Neighborhood park



Figure 44. Community garden

Site plan II

The second site plan has some similarities with the first one, for they share the same design patterns. For example, this site plan also has house clusters, row houses, shopping street, community garden, etc. However, there are some differences. Firstly, the circulation in the second plan is tree-structured—two main vehicular roads along the canal, connected with seven secondary roads. Totally there are 97 parking lots, taking up 5.4% of the site. Similar to Site Plan I, these parking lots are also dispersed along the vehicular roads.



Figure 45. Concept of Site plan II

Secondly, although this site plan also applies the same design patterns to housing, it has difference in building arrangements. To the east side of the canal still there are two commercial-combined residential buildings along the main road. And the two buildings are four storied—the first stories are retail shops and the upper stories are residential apartments. However, the location of the senior co-housing is not with the retail as in Site Plan I. It is

Site plan II



Figure 46. Site plan II

located in the west, besides the public square, where the elderly have an easy access to the fitness equipment. And the co-housing is connected to the community center with a corridor, so the elderly also have an easy access to the facilities provided in the community center. Still, the 3-storied and 4-storied apartment buildings are mixed. Figure 46 shows the layout of the buildings in Site Plan II and figure 47 shows the composition of the buildings.

	30 m ²	60 m ²	90 m ²	Other	Total
Four storied			14	2 [▲]	16
Three storied	17	10			27
One storied				2 [●]	2
Total	17	10	14	4	45

▲ There are two commercial-combined residential buildings which are also four-storied.

● Both the senior co-housing and the community center are one storied and 300 m².

Figure 47. Composition of the buildings in site plan II

There are two U-shaped house clusters located in the northeast and southwest of the site. The one in the northeast has six buildings—four of them are 4-storied 90 square meters buildings and the other two are 3-storied 60 square meters buildings. And the buildings enclose a neighborhood park, which is similar as in Site Plan I. The house cluster in the southwest has four 4-storied buildings and two 3-storied buildings, and these buildings enclose a large community garden. The other residential buildings are arranged as row houses.

As for the open space, the second site plan has the same types of open spaces as Site Plan I has. The community park is proposed at the southern boundary, because it's good to have a connection from the site to the Hanwang Temple Square, which is on the southern side of the canal. There is also a sunken square inside the park, providing a gathering space, with the trellised walk around the square. Also, sand ground is next to the canal. The square outside the retail shops is similar as in Site Plan I. The public square in front of the community center is also very open, with regularly-arranged trees and fitness facilities. People can also get together on this square and do some outdoor exercises with the facilities. The neighborhood park surrounded by the buildings is a semi-open space and it's similar as the one in Site Plan I. There are four community gardens in this plan—two smaller ones are in between the row houses in the northwest and two larger ones are adjacent to the shopping street and the community park.

To sum up, these two site plans are very similar to each other, because they share the same design patterns and people's basic needs are firstly considered. They have the same number of residents and same number of residential buildings. The types of open spaces and buildings are also the same. Since the patterns can be used flexibly and repetitively, there are also some differences between these two plans (figure 48).

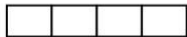
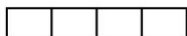


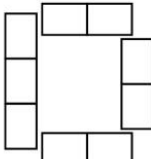
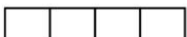

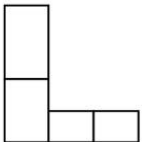
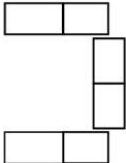
	Site plan I	Site plan II
Circulation	Loop structure 2870 m ² 7.37%	Tree structure 3754 m ² 9.67%
Buildings	1.92 hectares 52.6%	2.0 hectares 54.79%
Parking lots	2430 m ² 7.15%	1746 m ² 5.4%
Green space	1.2 hectares 32.88%	1.1 hectares 30.14%
Location of community park	in the middle	in the south
Types of house clusters	  typical row houses   varied row houses  "O" shaped	  typical row houses  "L" shaped  "U" shaped

Figure 48. Comparison between two site plans

Conclusion

This thesis addresses the social issues of land-lost farmers in China. Housing is used as a means to help relieve these issues. The background of the problems is researched. The site in Suzhou is analyzed with respect to land use, circulation, historic markers, and view sheds. The design principles are formulated from adopting design patterns in *A Pattern Language*. So with a better understanding of the problems, and combined with the specific site context, it's possible to apply the same set of design patterns into a specific site. However they could be applied in different combinations. The site design project with two possibilities of the application of the patterns is proposed here as an example.

The land-lost farmers are a vulnerable group of people. Housing for them should be based on social concerns, cultural identity, and historic preservation. Since the farmers have some special needs, the landscape design should serve their requirements. This project is an experiment in how to design the residential landscape for land-lost farmers. It is hoped that it can be a precedent to solve this social problem.

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